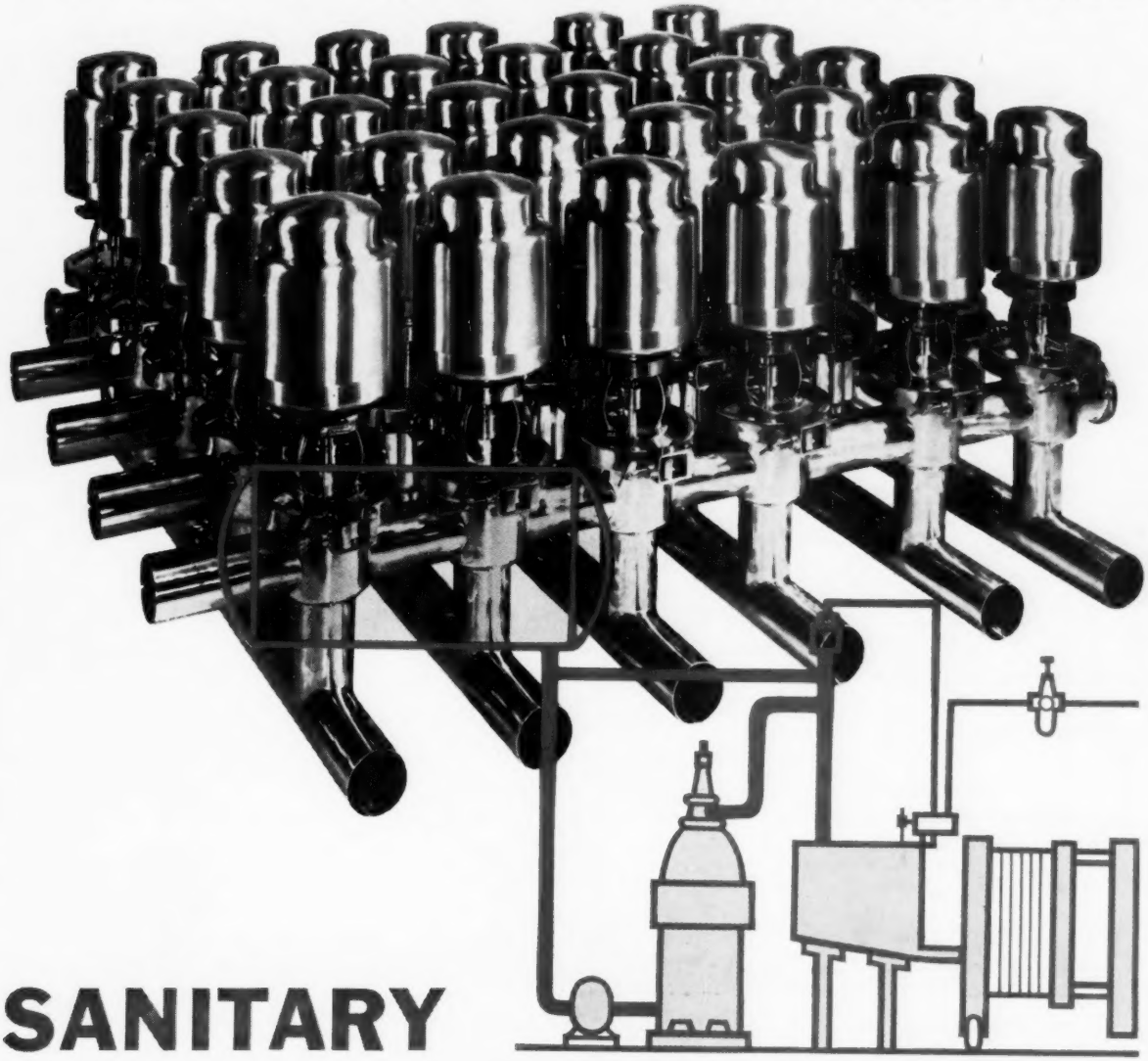
DECEMBER 1961

FOOD ENGINEERING

A CHILTON PUBLICATION

FOR BETTER MANAGEMENT IN MANUFACTURING



SANITARY AIR-ACTUATED VALVES

FE SPECIAL REPORT p. 69

ALSO . . .

London Freeze-Dry Seminar p. 37 • '62 Food Industry Outlook p. 40

Our big three in cartons meet everyday at Olin

The big three in cartons are the graphic designers, the structural designers and the printers. Olin has made them even more important by bringing them together under one roof. The continual interchange of ideas possible at the Olin Carton Service not only produces better cartons, it avoids any of the many mistakes that can happen when Creative is three states away from Structural, and Printing is in another time zone.

The cartons turned out by Olin's centralized (and talented) staff are made of Omnikote, the strongest board in the industry. They are printed by one of the most advanced printing establishments in the world. And they are graphically designed to do the job of flagging down the nearsighted housewife who's left her glasses home. So if you're having trouble with cartons, tell us about it. Olin's big three probably have the answer.

PACKAGING DIVISION Olin
FOREST PRODUCTS OPERATIONS, P.O. BOX 1225, WEST MONROE, LA.

CIRCLE 2 ON INQUIRY CARD

FOOD
ENGINEERING
FOR BETTER MANAGEMENT IN MANUFACTURING

VOL. 33 NO. 12

December, 1961

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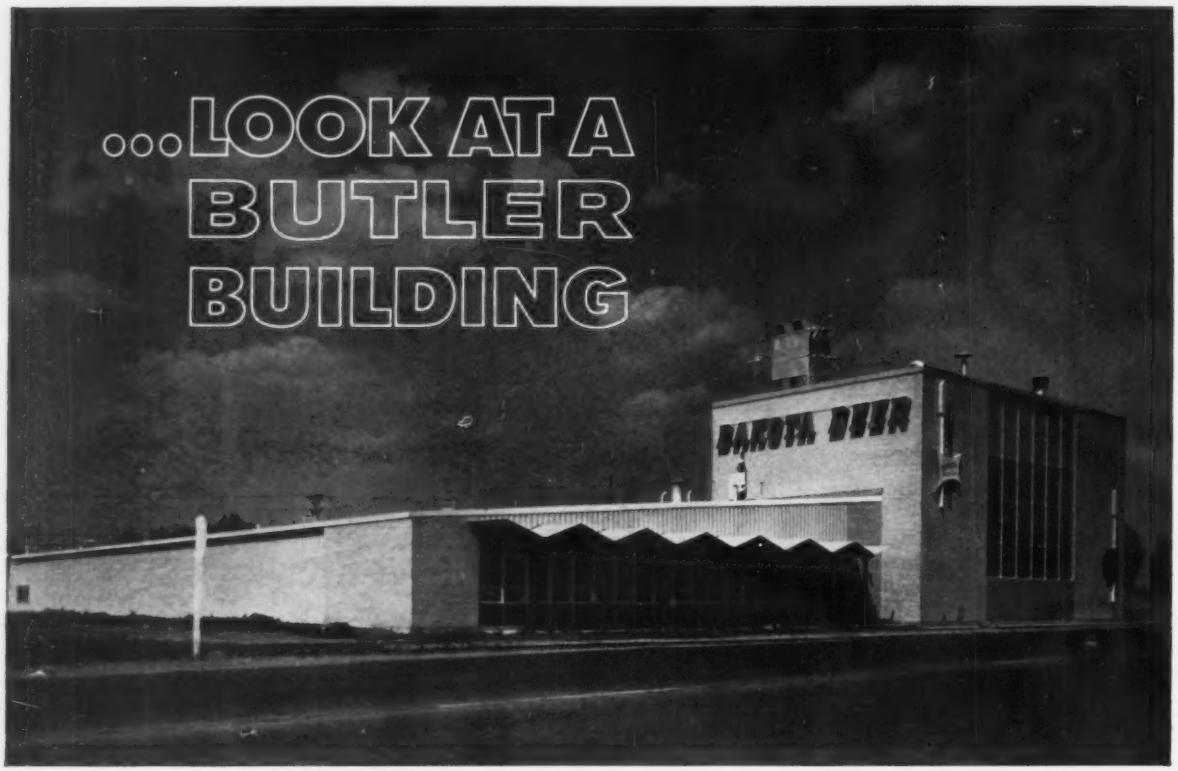
Editor F. K. Lawler

EDITOR REPORTS ON EUROPE

Frank Lawler lectured at a symposium on freeze-drying in London and looked into advances in food manufacturing abroad. FE is reporting his findings. First article in series is on p. 37.

WANT AN ATTRACTIVE, FUNCTIONAL BUILDING AT THE LOWEST ULTIMATE COST?



Dakota Brewery, Bismarck, North Dakota, Architect/Leonard & Askew, A.I.A., Bismarck, North Dakota

THIS new Butler building is as attractive as it is functional. The architect tastefully combined face brick with two Butler factory-insulated wall systems – Monopanl® and Modular Wall® – to achieve the distinctive appearance. Each wall system is as colorful as it is efficient – factory finished inside and out in durable Butler-Tone® colors that will provide years of lasting beauty.

The one-story portion is Butler's new MRF design – one that has already received rapid acceptance in the food processing industry for large area buildings. Dakota Brewery chose MRF because it gave 50,000 square feet of floor space with a minimum of slender interior columns, completely eliminating interior gutters and downspouts. The roof is aluminum, factory finished bone white, insulated with glass fiber insulation; and it carries Butler's 20-year guarantee – an industry exclusive.

Every component of this efficient building was selected with *Ultimate Cost* in mind – Initial Cost *plus* anticipated maintenance expense. This is the *true* cost of any building material. Yet the initial cost was appealing too – well below that of the flat roof structure originally considered.

If you're in the market for a new building, it will pay you to consider the completely redesigned, restyled line of Butler Buildings. Phone your Butler Builder today. He's listed in the Yellow Pages under "Buildings" or "Steel Buildings." Ask about Butler's "Finance Formula for Progress," too. Or write.

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CIRCLE 4 ON INQUIRY CARD

FOOD Engineering

Chestnut & 56th Sts.
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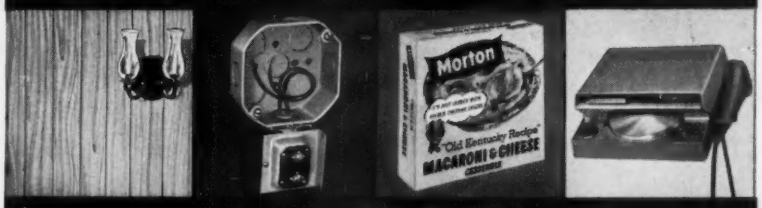

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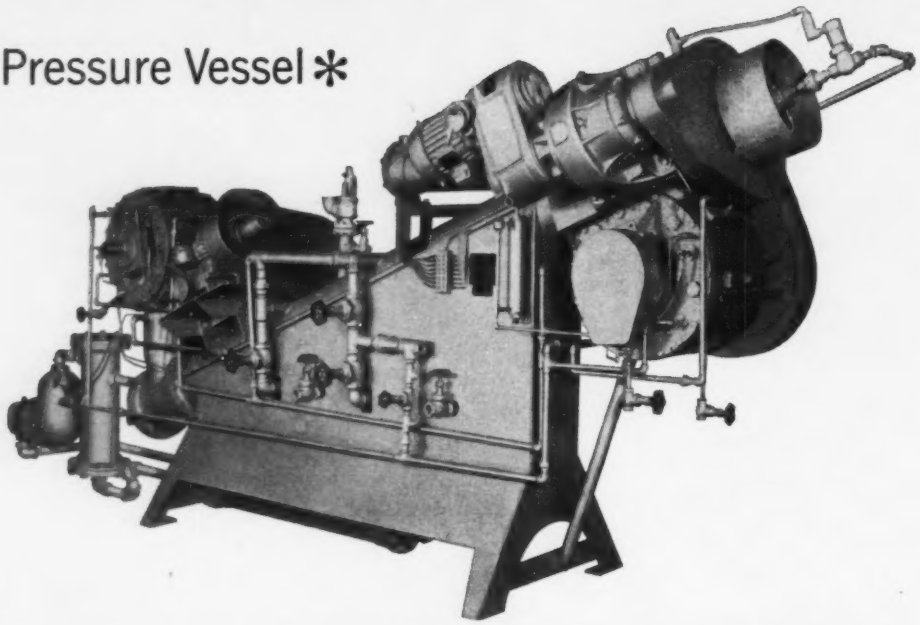

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NOW AVAILABLE FOR A VARIETY OF APPLICATIONS

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Inedible animal fats Poultry offal and feathers	Instant coffee Animal bone protein	Potatoes and other root-type vegetables	Cereals For human consumption For dog foods Rice parboiling Soybean thermal processing

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FMC Continuous Pressure Vessel equipped with stainless steel "Transol"® feed and discharge valves, capable of operation under as much as 120 psig. Built to ASME codes. Control instruments make it fully automatic. Typical input capacity for thorough cooking of cereals: 1400-4000 lbs. per hour, with 3-8 minute exposure at 15-30 psig.

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Because information on the commercial application of many products is not available, FMC maintains pilot plant operations which can be used for testing under special arrangements. Product samples and process information can be prepared under controlled production conditions for customer evaluation. Please direct your inquiry to Dept. FP-1, giving full particulars, or call your nearest FMC representative.

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TRENDS & FORECASTS

Expenditures for foods and beverages will increase 2.8% to $83.3 billion rate in 1st half of '62, in opinion of industry economists polled by FE. GMA forecasts $78 billion for foods. Alcoholic beverages usually account for $9 to $10 billion of expenditure.

Convenience products gained 55% in sales between '59 and '60, almost seven times increase for grocery store sales as whole, Nielsen finds.

Failure to keep brand up to date is greatest cause of lost leadership (67%). Brands losing principally because relative advertising support was reduced account for other 33%, Nielsen says.

Consumer pressure for low prices may result from high proportion of younger, low-income groups in population mix. This could boost sales for private labels and cut profit margins.

Capital expenditures by leading food and beverage manufacturers will be up 26% in '62 to $1.23 billion, one authority forecasts. Capital expenditures abroad by U. S. food firms will be down 29% to $101 million.

Abundant supplies of foodstuffs are virtually assured for '62, USDA says. Expenditures for food are expected to increase. Prices should not rise much. Per capita consumption may gain slightly.

Profits improved 5% for 36 leading food and beverage manufacturers in first nine months of '61 compared to year earlier.

Expenditures for food are running 3% higher than in '60, and per capita consumption is up slightly, according to USDA.

Frozen green pack is 352.4 million lb., up 23% NAFFP reports.

Six Common Market countries, together with "outer seven" nations in Europe, spend $73 billion a year for food.

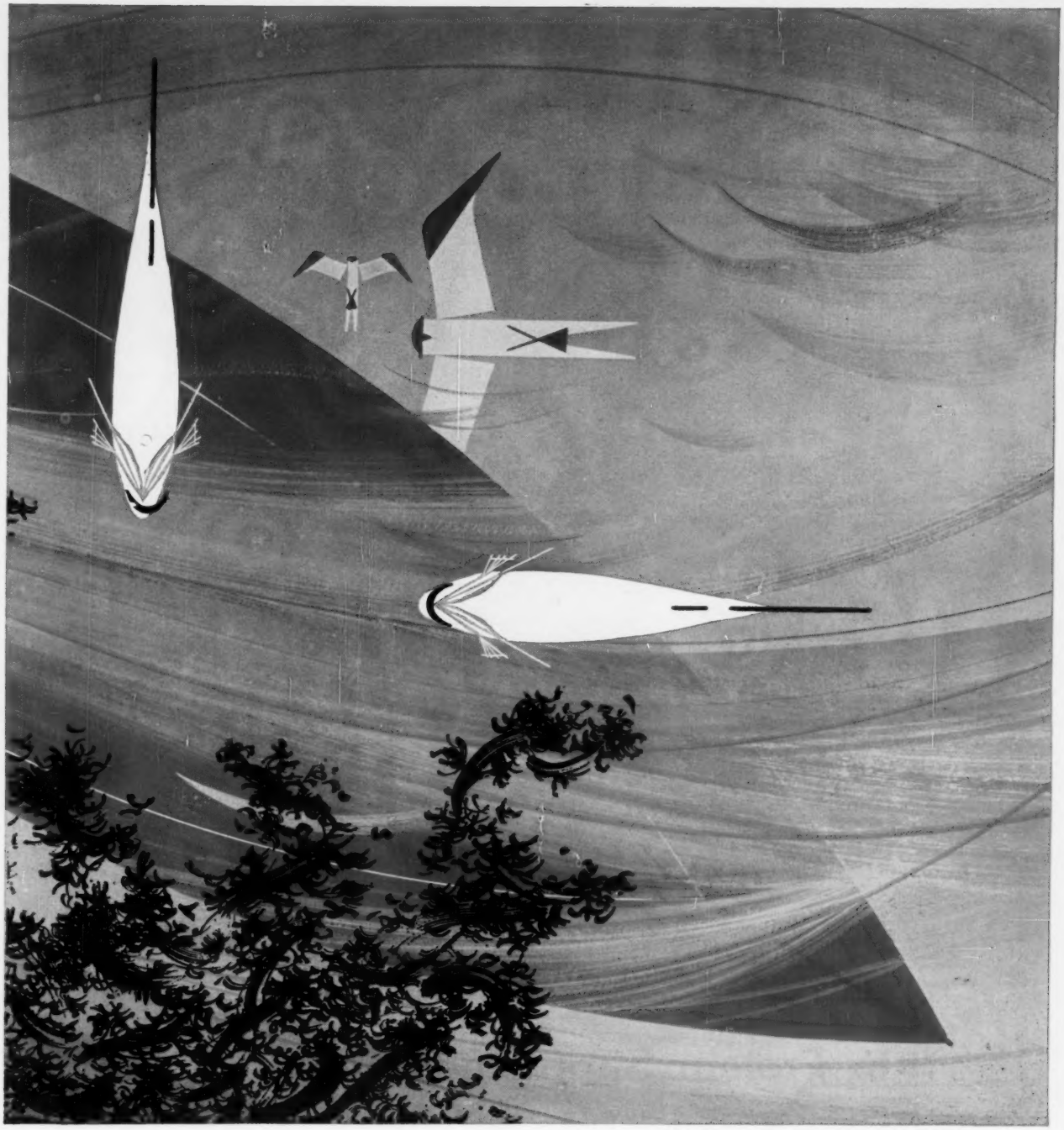
Super markets and self-service stores in Western Europe, along with desire of Europeans to buy foods packaged and with built-in conveniences, account for $1 billion business for U. S. food exporters.

By '70, half of total food sales in Europe will be through self-service stores, International Supermarkets predicts. This compares with 95% in U. S. now.

Average Russian diet is 62% bread and potatoes. Soviet meat production dropped under 50% of U. S. output in '60. More than half of family budget goes for food.

See Developments to Watch p. 15

A MIRACULOUS STABILIZER OF INFINITE USES—Beneath the pounding surf off the rugged coasts of Maine and Nova Scotia, grows a plant the fishermen call "Irish moss." For centuries Irish moss was "just another seaweed." Yet today this plant is raked from the cool ocean floor, dried by the sun and specially processed by Kraft under conditions of maximum sanitation, to produce an extremely effective natural stabilizer known as Kraystay. In essence, Kraystay is the edible extract of Irish moss, a natural gum that functions to: Stabilize—Emulsify—Suspend—Thicken—Gel. Every reason why, if the products you make incorporate a stabilizing, emulsifying or thickening agent, you should investigate the economy and consistent performance offered by versatile Kraystay. In new product development, Kraystay can play a vital role, too. And if you use a thickener—



Kraystay's special properties can help you produce a smoother, more consistent product, one with better "mouth feel." Remember, Kraystay is easily dispersed in cold water and goes completely into solution at 165 degrees. The coupon below will get you the complete story of Kraystay from Kraft.

KRAYSTAY vegetable stabilizer by **KRAFT**

Kraft Foods Industrial Division E-8
500 Peshtigo Court, Chicago 90, Illinois

Please send me more information on Kraystay.

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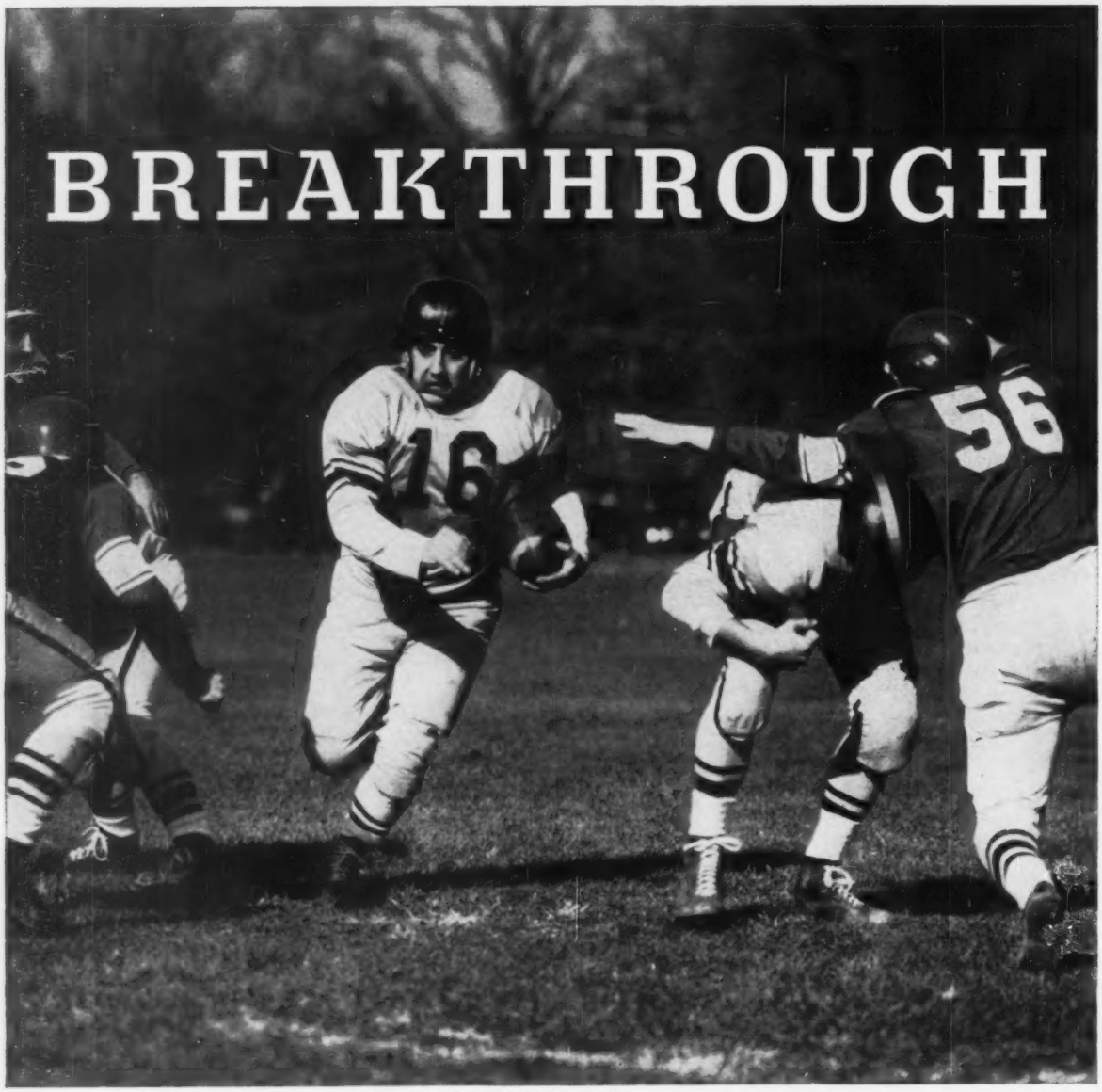

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San Francisco, Salt Lake City, Denver

Braun Chemical Co. — Los Angeles, San Diego, Phoenix, Albuquerque, El Paso

Schedule of Events

December

5- 7—Institutional Food Mfrs. Assn., 9th Annual Meeting, Edgewater Beach Hotel, Chicago.

5- 7—Nat'l Dried Bean Council, 5th Annual Research Conference, Brown Palace Hotel, Denver.

6- 8—Nat'l Assn. of Manufacturers, 66th Annual Congress of American Industry, Waldorf-Astoria Hotel, NYC.

January

19-20—Nat'l Preservers Assn., meeting, Galt Ocean Mile Hotel, Ft. Lauderdale, Fla.

22—Nat'l Canners' Assn., annual meeting and '62 Canners Convention, Americana Hotel, Bal Harbour, Fla.

22-26—Nat'l Plant Engineering & Maintenance Show, Convention Hall, Philadelphia.

February

6- 8—Material Handling Institute Inc., spring meeting, Hilton Inn, Atlanta.

9-11—Institute of American Poultry Industries, 33rd Annual Fact Finding Conference, Kansas City, Mo.

12-15—Air Conditioning & Refrigeration Institute, 12th Exposition, Pan-Pacific Auditorium, Los Angeles.

HORS D'OEUVRES

When USDA cut permissible moisture content of ham 10%, the do-gooders upped the price and impaired the quality. With friends like that, consumers need no enemies.

A British firm claims $4,966 damages for the tea dumped into Boston Harbor in 1773. Somebody's been drinking a beverage stronger than tea!

Water pollution in Russia constitutes a threat to the national economy, says a Soviet hygiene journal. Yes, when it comes to pollution—water, air, and the minds of men—the Soviet is the all-time champion.

Machine-vended frozen foods are heated in 2 min. electronically in new 24-hr. restaurant for motorists. This is a Standard Oil assist to travelers who don't like to lose 60 miles per meal—and to poor families rich with children.

Nowhere, at no time, have Communist methods licked a nation's food problem — not even in Russia. No wonder the world is hungry for free enterprise.

When an Englishman treats you to a drink he doesn't offer a second. Instead, he asks, "Won't you have the other half?" We did.

The revolution in food distribution is doing more for the world than anything the Kremlin can muster. And as Look's Gardner Cowles observes, the true revolutionaries of the world are the businessmen in America and Western Europe.

CJ COOKER-COOLER

Saves Time, Labor In Both Operations and Between Them

THE Chester-Jensen Cooker-Cooler offers means of mixing, cooking and cooling in successive stages within the same vessel practically any pourable semi-liquid food or other product, at temperatures between 212°-40°F., or lower if required.

High heat-transfer efficiency and positive agitation shorten cooking and cooling time. Costs for heat and coolant are lower; handling between load and unload is eliminated; controlled mechanical agitation, or stirring, assures uniform cooking — curbs damage to product; product is cooled more quickly after cooking; sanitation is improved, cleaning time reduced.

Cooker-Cooler is built of stainless steel, in two types and three sizes. The large illustration above shows the Atmospheric Type, which is fitted with hinged covers. Small illustration shows the fully enclosed Vacuum Type, which operates under vacuum or pressure; can move product to destination by air pressure.

Further details are available upon request.

Uses Include Cooking and Cooling Food Products for Freezing, Canning or Ingredient Purposes Such As:

Sliced or Diced Vegetables and Fruits • Berries
Pastry Fillings
Frostings • Candies
Jams and Jellies
Creamed or Sauced Products • Soups
Stews • Relishes
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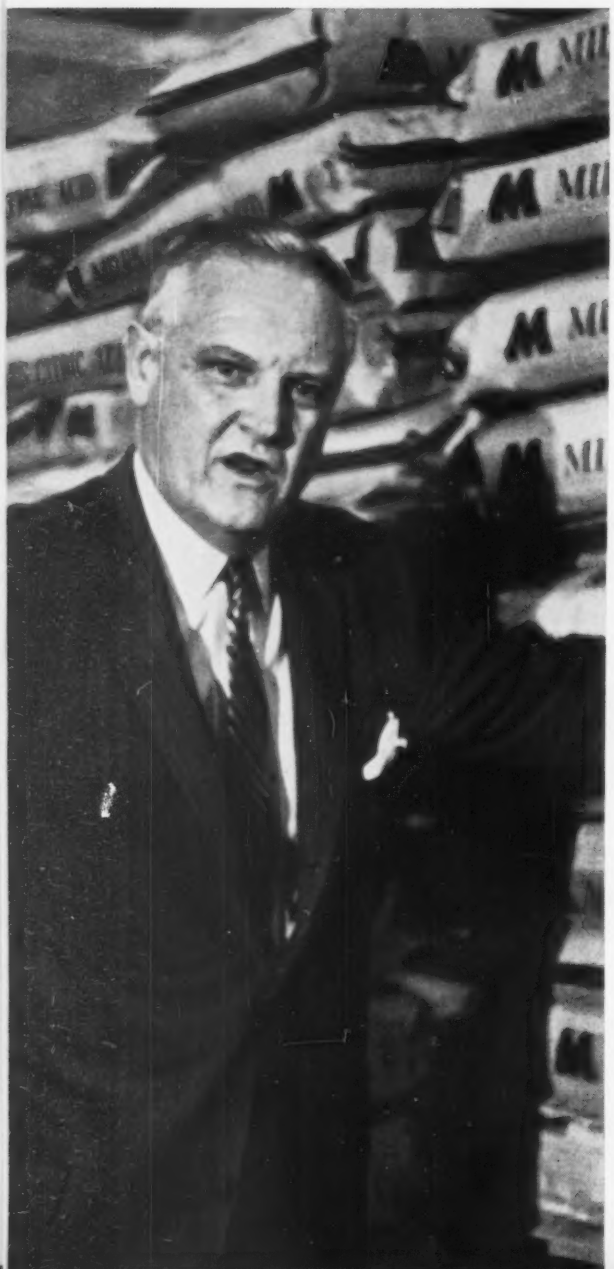
BUILDERS OF AMERICA'S FIRST PLATE HEAT EXCHANGER

"We don't want Citric Acid



"One-supplier" dependence . . . no matter how good that supplier . . . is clearly a dangerous practice — says Howard F. Roderick, President, Miles Chemical Company.

We used to be dependent on just one supplier for citric acid. For obvious reasons, we didn't like it. Because no one supplier is completely safe from trouble. Fires, floods, process problems, transportation difficulties and national emergencies can cripple any supplier's ability to serve your important needs.

To beat this "one-supplier" situation we began manufacturing citric acid to fill our own needs. And we built plenty of extra capacity to help relieve other users from supply pressures. Because Miles has invested over $12 million in plant and development costs, industry now, for the first time, has the extra protection of competitive buying for this vital commodity.

Reactions to this important step have been interesting. Some buyers, like Miles, are deeply concerned over the "one-supplier" relationship. They react by dividing their business on a rational basis.

Others move in the same buying-habit patterns as if unaware that the market now offers freedom of choice and all the opportunities which this new condition implies.

all of your business"...

We feel a word of caution is in order. Anything approaching total dependence on one supplier . . . even if we are that supplier . . . is a dangerous purchasing practice.

May we suggest that you examine your company's citric acid buying plans? The market has changed. Have your people taken the extra measure of caution which this new broadened market situation warrants?

Miles products for the industry:

In addition to citric acid, Miles Chemical Company can fill your needs for sodium citrate, for fine organics, or antioxidants, and can provide the widest choice of commercial enzymes available from any supplier. For information about any of these products write Miles Chemical Company, Division of Miles Laboratories, Inc., Elkhart, Indiana.

"Competitive buying from well-qualified suppliers remains the purchaser's best protective measure."

Dean Ammer, Executive Editor of *Purchasing* Magazine, when queried for an opinion on competitive buying, responded: "Competitive buying from well-qualified suppliers remains the purchaser's best protective measure. That this procedure is a cardinal rule of good purchasing practice is reflected in the written purchasing policy of practically every leading manufacturer. In no other way can the purchaser be confident of the most reasonable price for the quality he requires . . . nor . . . as importantly . . . can he have protection of vital supplies in times of crises in the market."

MILES CITRIC ACID

C-9-1

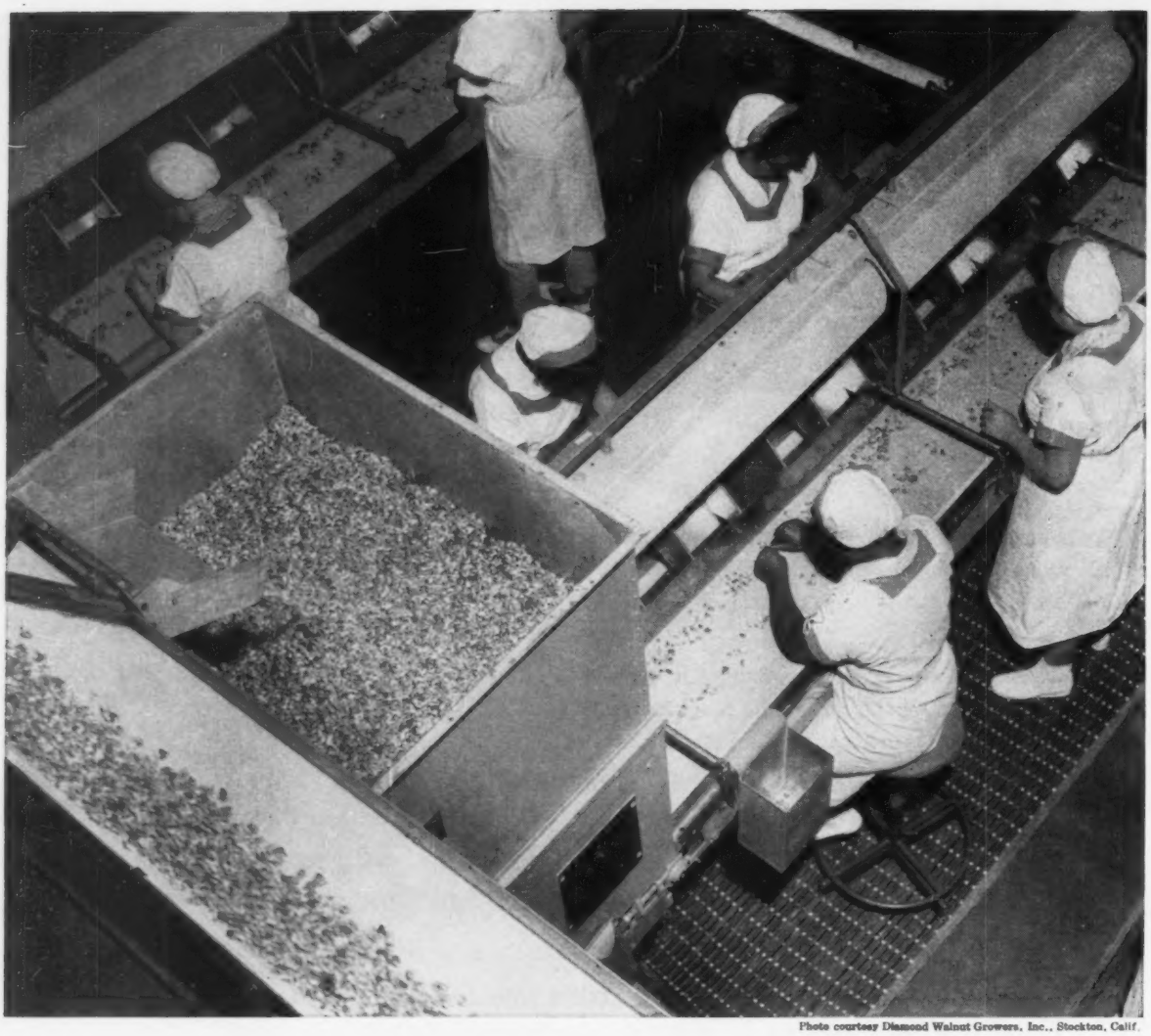


Photo courtesy Diamond Walnut Growers, Inc., Stockton, Calif.

Koroseal gets along well with a lot of nuts

FORTY tons of shelled walnut meats flow through this plant every day. At one time, cotton belts conveyed the nuts from storage bins to grading tables to packaging. But it took a lot of time, a lot of scrubbing to keep these belts clean. Oil from the nuts soaked into the cotton, stained it, sometimes made it rancid. Plastic-coated belts were tried, but the oil softened them.

Then a B.F.Goodrich distributor heard about the problem. He recommended B.F.Goodrich belts made of Koroseal vinyl. Unlike belts that are just coated with plastic, Koroseal is used throughout the BFG belt and so resists cracking and peeling, never gets soft or sticky.

Koroseal doesn't absorb odors, has no odor itself to transfer to food. And since oil can't soak into Koroseal's smooth, polished surface, this BFG belt is easy to wash clean as your dishes at home.

Belts last 50% longer

After trying a test belt, engineers at this walnut-processing plant had Koroseal belts put on all the conveyors handling shelled nuts. The B.F.Goodrich belts not only solved the clean-up problem, but so far have outlasted previous belts by 50%. The soft green color of the belts on the grading tables reduces eye strain, makes it easier for inspectors to pick out shells and off-color nuts.

For more information on the Koroseal belt or any of the others developed by B.F.Goodrich for cleaner, more efficient food handling, call your BFG distributor or write *B.F.Goodrich Industrial Products Co., Dept. M-197, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich

CONVEYOR BELTS

DEVELOPMENTS TO WATCH

Japan Instant Foods is freeze-drying soup, minced meat, and scrambled eggs in Atlas unit. Continuous freeze-dry tunnel is being installed in Italy by Leybold.

Continuous mashing and wort boiling are being pilot tested in three London breweries. Better quality control, less floor space, lower overall capital investment are benefits.

Jelling of HTST evaporated milk can be prevented by stabilizing with polyphosphates, commonly added to processed cheese, USDA reports. Short-high process reportedly avoids cooked flavor.

Fruits in flexible packages can be heat processed and will maintain satisfactory appearance during storage, say Quartermaster researchers. Non-acid products can be similarly preserved, tests indicate.

Highly aromatic cottage cheese can be made by new process. Aroma-producing bacteria are grown in cheese whey containing citric acid. This is added to cheese for flavor.

System for recovering solids from ice extracted in freeze-concentration is Commonwealth Engineering development. Hot side of refrigeration cycle melts ice, and solids settle out.

Salt is separated from sea water by freezing in new process. Refrigerant (butene) is in direct contact with water. Low cost of 28¢ per 1,000 gal. is estimated.

Cost is cut 75% by purchasing filter-aid in new 1,200-lb. carton and using vibrator to feed material directly to process.

No interior coating is necessary for aluminum cans containing most frozen fruit juice concentrates, Alcoa tests indicate.

Drawn, seamless round aluminum can is being used for tuna in experimental pack by Van Camp. Aluminum beer cans are foreseen.

Birds Eye and Winter Garden will make aluminum cans for citrus juices, aluminum supplier says. Minute Maid makes cans, too.

More accurate fill of 6-lb. cans is achieved in new way. After approximate-fill can passes over weight classifier, latter signals one of three fillers to add proper quantity.

Heat-sealed transparent "bag" is formed around tray of cookies by Campbell wrapper. Machine also packs two cans together by overwrapping with heat-shrink film.

See Who's Building What p. 16

Washington Report p. 23

FOOD WRAPPERS of *Non-Toxic—Pure White—vegetable parchment*

DESIGNED to make your brand attractive and outstanding

AND PRINTED with colors that make your product appetite appealing

We have the facilities to make your moist-food wrapper.
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Margarine Wrappers
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Poultry Box Liners
Poultry Wrappers
Release Parchment
Sausage Wrappers
Sliced Cheese Interleaving Parchment
Special Parchments for Frozen Foods
Tamale Wrappers
Tri-Wrap & Duo-Wrap for Smoked Meats
Vegetable Crate Liners
Vegetable Shortening Carton Liners

Silicone • Mycoban • Quilon & Dry Waxed Parchment
Clean Food Paper—Interfolded and Wall Pocket Cartons

Who's Building What

Monthly Reports: These food firms will spend $10,014,436 for expansion.

Contracts Awarded

American Maize Products Co., Hammond, Ind., warehouse & office expansion, $1,500,000.

Campbell Soup Co., Camden, N. J., plant & office addn., $1,800,000.

Dixie Bottle & Beverage Co., Atlanta, Ga., warehouse-office, $200,000.

General Foods Corp., Hoboken, N. J., warehouse, $125,000.

George A. Hormel & Co., Charlotte, N. C., cold storage meat warehouse-office, $165,000.

Montgomery Dairy Inc., Troy, N. C., plant addn., $163,936.

Nesbitt's Orange Ltd., Montreal, Que., plant extension, $300,000.

Ottenberg Bakery Co., Washington, D. C., bakery, $375,000.

Seaboard Allied Milling Corp., Chattanooga, Tenn., flour mill, wheat elevator, $750,000.

S. T. Musser, Calhoun, Ky., potato chip plant, $340,500.

Stop & Shop, Readville, Mass., food processing plant, $300,000.

Vita Food Products, Chicago, food packaging plant, $800,000.

Western Farmers Assn., Portland, Ore., poultry & egg processing plant, $750,000.

Proposed Projects

Bumble Bee Seafoods Inc., Cumberland, Md., tuna fish cannery, $1,500,000.

Castle & Cook Inc., Cambridge, Md., tuna fish cannery, $400,000.

Charlotte Fish & Oyster Co., Charlotte, N. C., fish processing plant-office, $185,000.

H. L. Hunt Products Co., Jacksonville, Tex., vegetable processing plant, $110,000.

Maine Livestock Producers Assn., South Portland, Me., abattoir & meat processing plant, $300,000.

CIRCLE 16 ON INQUIRY CARD

CIRCLE 17 ON INQUIRY CARD →

What can lemon juice do for canned shrimp?

It maintains freshness, improves flavor and prevents darkening due to the development of iron sulfide. It also helps control struvite formations by reducing pH and leaching out or sequestering magnesium.

...for canned soups?

Exchange Concentrated Lemon Juice helps improve flavor. Used below the threshold of lemon taste, it enhances characteristic flavors of a wide variety of soups—including cream of mushroom, cream of tomato, vegetable-beef, pepper pot and bouillon—without imparting any detectable lemon character.

...for your product?

Send us the coupon today—and let our researchers tell you what lemon juice can do for you.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

GENTLEMEN: *Our product is* _____

_____ *How can lemon juice help?*

NAME _____

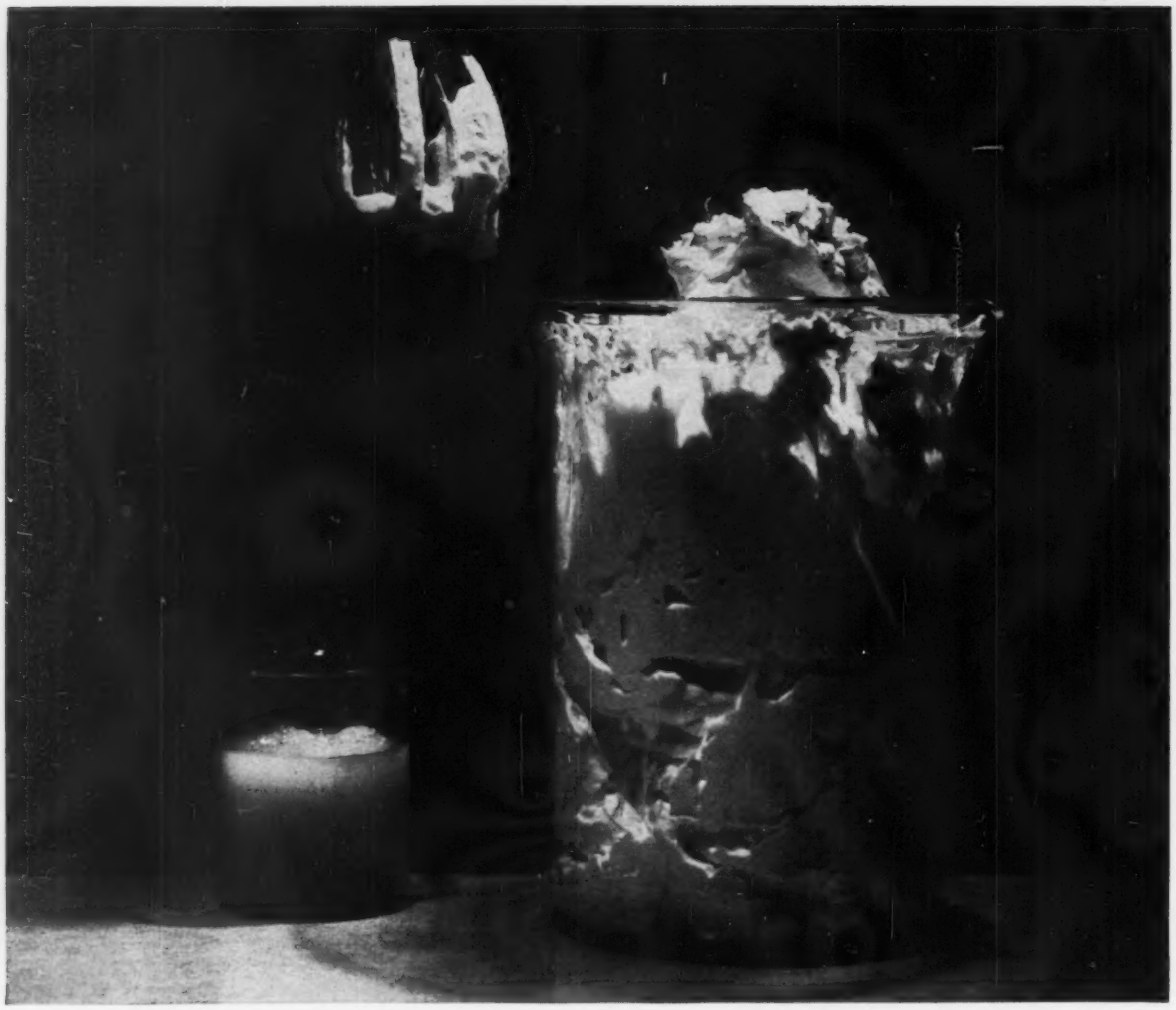
COMPANY _____

ADDRESS _____

CITY _____ ZONE _____

STATE _____

Exchange



This is applesauce whipped to 1000% overrun

Just add 1% *Myverol® Distilled Monoglycerides, Type 18-00*, to the sauce, heat, and whip (hot or cold).

The same technique produces beautiful whips from pears, bananas, peaches, tomato juice, grape juice, sweet potatoes, all sorts of strained or pureed fruits and vegetables.

Can you see a new idea in toppings, canned in the normal manner and marketed —ready to heat, stir, and whip? Can you see spray-, drum-, or foam-dried purees, ready to be whipped after reconstituting with hot water?

Like to try some ideas of your own? For more information and samples of *Myverol Distilled Monoglycerides*, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

CIRCLE 18 ON INQUIRY CARD

CIRCLE 19 ON INQUIRY CARD →

Since Allegheny Ludlum Stainless Steel provides the highest known sanitary protection, it easily meets the exacting requirements imposed on food plants by sanitary inspection laws. The spotless appearance of stainless equipment stresses the hygienic precautions that have to be maintained. Stainless Steel takes the constant rubbing, hosing-down and steam necessary for cleaning and maintenance.

Turn the page for the newest Allegheny Stainless developments for the food processing industry.

3609

These Newest Developments in Applying Stainless Steel Promise Lower Costs

Recent experiments prove lower cost 200-series stainless OK for Dairy Equipment

The dairy farm's current transition from the ten-gallon cans of milk cooling in the spring house, to a modern, refrigerated stainless steel bulk storage tank should gain momentum as the result of a test recently completed at The Pennsylvania State University, and the results should interest all food processors.

An experimental 205-gallon bulk milk tank, fabricated from a more economical, relatively new type of stainless, has proved successful in handling milk during a 3½ year service test at Penn State's milk production center.

Results suggest that Allegheny Ludlum Type 202 Stainless, in which manganese replaces much of the nickel as a component, can handle milk as efficiently and safely as the more expensive grades of stainless from which Penn State's other bulk tanks were made. It can also be cleaned and sanitized easily.

Reports state that the 3½ year old tank "remains in perfect condition, entirely free of pits or corrosion, stains or discoloration. The finish, on both the outside and inside, looks as good as new."

The Type 202 tank has behaved in every respect like Penn State's other tanks, which are made from the famous Type 302—18 percent chromium, 8 percent nickel stainless steel. Washed with a regular alkaline dairy cleaner, the "202" tank received cleaning service identical to the other tanks. Each was also cleaned weekly with a standard organic acid dairy cleaner to remove hard water deposits.

The Type 202 stainless maintained the high quality taste of the milk and did not affect the bacteria count, two of the most important considerations of dairy equipment. Any food processor following the same cleaning procedures should consider the Allegheny Ludlum originated 200-series, Stainless Steels as food for thought.

More local stocks of A-L Stainless

In the past several years, A-L has added additional distributors. For the names of the Steel Service Centers in your location who stock Allegheny Stainless just ask the A-L representative or call the district office.

Sanitation Studies show economical #2B or #3 finish stainless as bacteriologically cleanable as expensive #4 or #7.

Research recently completed at Michigan Agricultural Experiment Station, Michigan State University, concludes—"since there was no significant difference in the bacterial counts of the four finishes, it must be concluded that there is no difference in the relative cleanability of these four finishes and that any of these finishes should be satisfactory for dairy processing equipment from a sanitation standpoint."

By switching to a #2B finish, first costs of a piece of equipment can nearly be halved.

The project was supported in part by the American Iron and Steel Institute and the National Association of Dairy Equipment Manufacturers. A reprint of the study is available from any A-L representative or by writing to headquarters.

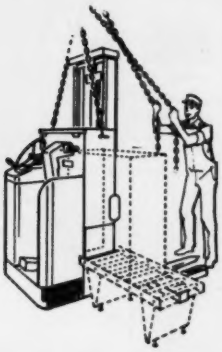
The research should be studied by everyone concerned with food processing equipment. 3609

A-L's New Research Center offers assistance on any of your problems

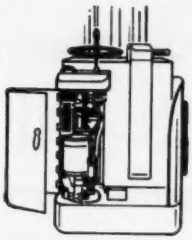
Consolidated in one center is all of A-L's research personnel, probably the largest group in the specialty steel industry. The vast experience and knowledge of the pioneer producer of stainless steel is at your service.

ALLEGHENY LUDLUM

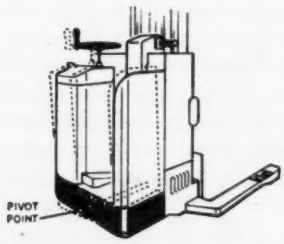
HERE'S HOW *ASD** MAKES THE MODEL VST EASIER TO DRIVE AND SERVICE



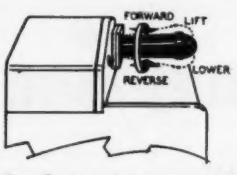
Battery removal top or side. Battery can be rolled out from either side. Steering wheel and Quadtrol controller swing back to allow overhead removal or servicing.



Accessibility of parts simplifies servicing. Rear cover swings out to put drive motor, electrical components, and brake within easy reach for servicing.



Knee action frame assures stability under all conditions. Straddle arm section pivots independently of drive unit section, preventing frame distortion, lack of traction, and instability on uneven floors.



Quadtrol control handle combines speed and lift controls in one unit for easier driving. One handle controls three speeds forward and reverse, plus lifting and lowering of the forks.

IT'S SO EASY TO DRIVE, NARROW AISLES SEEM WIDER

*Advanced Simplified Design has made this new AUTOMATIC Model VST a real performer in narrow aisles. It is not only extremely compact and maneuverable, but its simplified controls permit faster, safer driving. Aisles actually seem wider with the Model VST on the job. Result: More goods handled in space-saving narrow aisle warehouses and other cramped storage areas.

Thanks also to Advanced Simplified Design, maintenance is easier and requires less time. The truck stays on the job longer and moves maximum tonnage. The Model VST is available in capacities of 2,000, 3,000 and 4,000 lbs. Get the full details. Ask your AUTOMATIC dealer, or send coupon for Model VST literature.

Only AUTOMATIC trucks have *Advanced Simplified Design

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A Division of The Yale & Towne Manufacturing Company

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Please send Specification Sheet on Model VST narrow aisle truck.

Name_____ Title_____

Company_____

Street_____

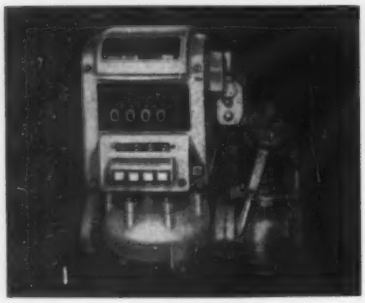
City_____ Zone____ State_____

Auto-Switch Meter Controls Pumps, Valves, Relays

Neptune Auto-Switch register features an explosion-proof switch which is actuated automatically when any desired quantity of liquid has passed through the meter. The switch can be used to turn pumps on or off, actuate solenoid valves, start agitators, or control other cycling operations by use of suitable relays, etc. which can be devised.

The Auto-Switch feature is available either with or without the mechanically coupled Auto-Stop valve.

In a typical example using the Auto-Switch Register with Auto-Stop valve, the operator clears the



register back to zero, and sets the register for the required number of gallons or pounds of liquid ingredient to be delivered to a kettle or mixing tank. He then opens the coupled Auto-Stop valve to start the cycle. This also closes (or opens) the switch. When the desired quantity has been delivered, the meter automatically trips the valve shut, and at the same time actuates the electric switch.

Gauge-Stick Errors of ⅛ in. Can Cost Thousands of Dollars

Inaccurate liquid measurements can add up to thousands of dollars a year in wasted materials, time, effort, to say nothing of lowered quality.

For instance, it's a tough job to read a gauge stick down inside a 4-ft. tank, particularly when the tank is being filled with hot steamy liquids, or when the liquid is swirling around. Yet an error of just ⅛ in. means that *one gallon too much or too little* has gone into the tank. This *can* add up to thousands of dollars in wasted batches in the course of a year's production.

For formula-perfect batches time after time, get rid of the stick and put a Neptune Auto-Stop meter in every liquid line leading to the blending tank or kettle.

How Neptune Syrup Meter

PAID OFF TWO-TO-ONE

in first year at J. Hungerford Smith

By permitting purchases of caramel color at tank-car prices, a complete storage and metering system paid for itself twice over in materials costs alone during the first summer. And this is only part of the savings made by J. Hungerford Smith Company, manufacturer of fine root beer flavors.

Formerly, the caramel color was purchased in drums, requiring much man-handling and storage space. It took a man full time to measure the syrupy material with buckets. Now it takes only a few seconds for each batch. The operator simply sets up the Auto-Stop and opens the valve. The meter does the rest... shuts off automatically at the exact quantity required by the formula. The meter even turns the pump on and off.

Biggest advantage of all, according to Mr. W. Carvel Martin, plant manager: "It takes the guesswork out of the formula."

You can make savings like this in your plant.

GET THE FACTS
Ask for helpful Meter Data Bulletin 566 LF See Neptune Data Pages in Chemical Engineering Catalog.

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Washington Report

World food grades . . .

Wet ham complaints

. . . FDA budget cut

Target World Food Grades

Look for international grading of edibles to become a hot subject. FAO meeting in Rome last month showed a growing demand for world-wide food standards.

Two worthwhile reasons for universal food standards: (1) protection of consumer health; (2) opening of new markets to processors and manufacturers. **Roughly, code would cover ingredients, control methods, and permissible limits.**

Under world-wide standards, local barriers against imported foods would be reduced. Theoretically, a manufacturer complying with international grades could be free to ship anywhere his product might be in demand. Each nation's food standards would not automatically become subject to world-wide code, however. Amendment of local laws would be necessary.

Officials lean to the view that greater international uniformity in standards would help this country, especially for exported fruits, vegetables, meats, and grains.

Court Review for Wet Hams

Did Agric. Secty. Freeman err in banning moist hams without waiting for views of meat experts?

U. S. Court of Appeals, in the week of Dec. 11, will hear complaint by Armour that Freeman was guilty of "capricious and arbitrary behavior" in imposing the ban Nov. 17 before hearing from experts who had been named to make proposals. Meat packer insists that (1) consumers prefer moist hams and (2) Freeman's order was based on "political chicanery" to discredit former Benson regime.

It's still legal for packers to sell wet hams within the state in which they're processed. **Armour, for example, says it can meet most of the demand by processing moist hams at its many plants and market at retail without crossing state lines.**

FTC Mum on Consent Decrees

FTC remains closemouthed about its progress—or lack of it—in checking on compliance with consent decrees as asked for by the Justice Dept. Although program is nearly a year old, FTC says it has nothing to report on the subject, doesn't know if it will ever have anything to report.

Commission lawyers have run into several snags in fishing for compliance information. One big outfit, for example, refused to let FTC rummage through its files on the grounds that it—not government—is proper judge of whether or not confidential company records can be examined at will by FTC. Others are thinking of taking the same tack.

Budget Chipping Won't Crimp FDA

FDA will trim spending plans by about 2% across the board. The packaging survey, factory inspection, lab testing—as well as other activities—are all affected.

Even so, FDA has much more money to spend this fiscal year. Congress voted the agency $23 million for period from July 1 to June 30, 1962—about $4 million (or 21%) more than in the previous 12 mos. So, despite the 2% flake-off—amounting to about $1,146,000—total is still comfortably ahead of the previous year.

Don't expect any less enforcement activity from FDA. While agency is barred from hiring as many new inspectors as it would like, it still has a bigger enforcement staff than ever before.

Cheap Hens To Rule the Roost

Price relief for broilers is many months away. While complaints from growers continue to arrive, USDA officials are still in pondering stage.

Broiler people are split. Some want a government marketing order (a volume ceiling on each producer); others insist depressed market will correct itself if left alone.

USDA is undecided whether to hurl official complaints at some broiler marketers, charging illegal price manipulation. (Such a complaint is now being fought by some packers and dealers in lamb). Even if issued, price relief via the courtroom is always slow in coming. And should a marketing order go into effect soon, it would not influence retail prices until next Fall, USDA sources say.

Tips for Local Probers

State governments were briefed by the Kennedy Administration last month on the care and feeding of consumers. Thirty-five state attorneys general met with U. S. Atty. Gen. Robert Kennedy in Washington to pick up tips on antitrust problems and consumer and investor protection. They also heard from FTC's Dixon and FDA's Harvey. First such conference was staged by Eisenhower Administration in March, 1960.

Crystal Ball Help

A new, monthly tool to help businessmen determine short-term economic trends is now available from Commerce Dept. Prepared by Census Bureau,

PROCESS CONTROL REFRACTOMETER

Sugar refining, food, chemical and other process industries

- **Vat or pipeline installation**
- **Continuous electrical output for chart recording or process control**
- **Accuracy unaffected by bubbles, suspended solids or turbulent flow**
- **Drift free, temperature compensated and self-calibrating transistorized electronics**
- **Rugged, maintenance-free construction**
- **Stainless steel and glass insertion probe**

Output: 0 to 1 volt dc (into 500Ω) from 20° to 35° Brix ±0.1° (1.364 to 1.390 ± .0002 refractive index).

Temperature Compensation: ± 0.1° Brix (± .0002 refractive index) from 60° to 85° F.

Power Required: 115 volts, 60 cps.

Size: 3" x 4½" x 14"; Standard 1-inch pipe fitting.

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7479

Washington Report *(Continued)*

report shows cyclical movements of about 70 principal indicators which are grouped as "leading," "coincident," and "lagging"—depending on whether they turn up or down before business in general does. The report doesn't make automatic forecasts, but is about the best single source of information on economic trends available today. Annual subscription of "Business Cycle Developments" is $4, from Superintendent of Documents, Gov't. Printing Office, Washington, D. C.

"Failing company doctrine" defense against antitrust suits is up for U. S. Supreme Court review. Doctrine holds that a competitor buying insolvent company does not substantially reduce competition. Justice Dept. claims corporations are being allowed to use the "failing company" defense more and more because of loose interpretation of the doctrine in lower courts.

BRIEFS

Animal Glue for Food Packaging use, manufactured by members of the Nat'l Assn. of Glue Manufacturers Inc., has received FDA approval for use in food packaging.

White Bread, Rolls, or Buns may now contain, as optional ingredients, shortening in which or in conjunction with which may be used lecithin, hydroxylated lecithin, mono- and diglycerides of fat-forming fatty acids, diacetyl tartaric acid esters of mono- and diglycerides of fat forming fatty acids, or a combination of two or more of these.

Soft drink bottlers can count on postponement of FDA labeling requirements slated to go into effect June 15. Multi-flavor firms led the opposition to FDA's proposal for ingredient listing.

Congressional group, preparing another look at complex problem of state taxes on interstate commerce, hopes to learn what it costs businessmen to comply with local tax laws, plus the kind of records that have to be kept.

Stepping up its campaign against employers accused of union-busting, NLRB is pressing court action to prevent company officials from illegally discharging workers for pro-union activities. Chairman Frank W. MacCulloch promises a "bigger stick" against firms which habitually interfere with union organizing.

U. S. Strawberry Council, formed to carry fight against Mexican imports to U. S. Tariff Commission, will get help on economic data from Giannini Foundation. Council says that berry influx this year will total 30 mill. lb., more than double what it was 2 yrs. ago.

Changes in Army diets urged by a new report which suggests reductions in use of items with saturated (solid) fats, increase in items relatively high in polyunsaturated fatty acids.

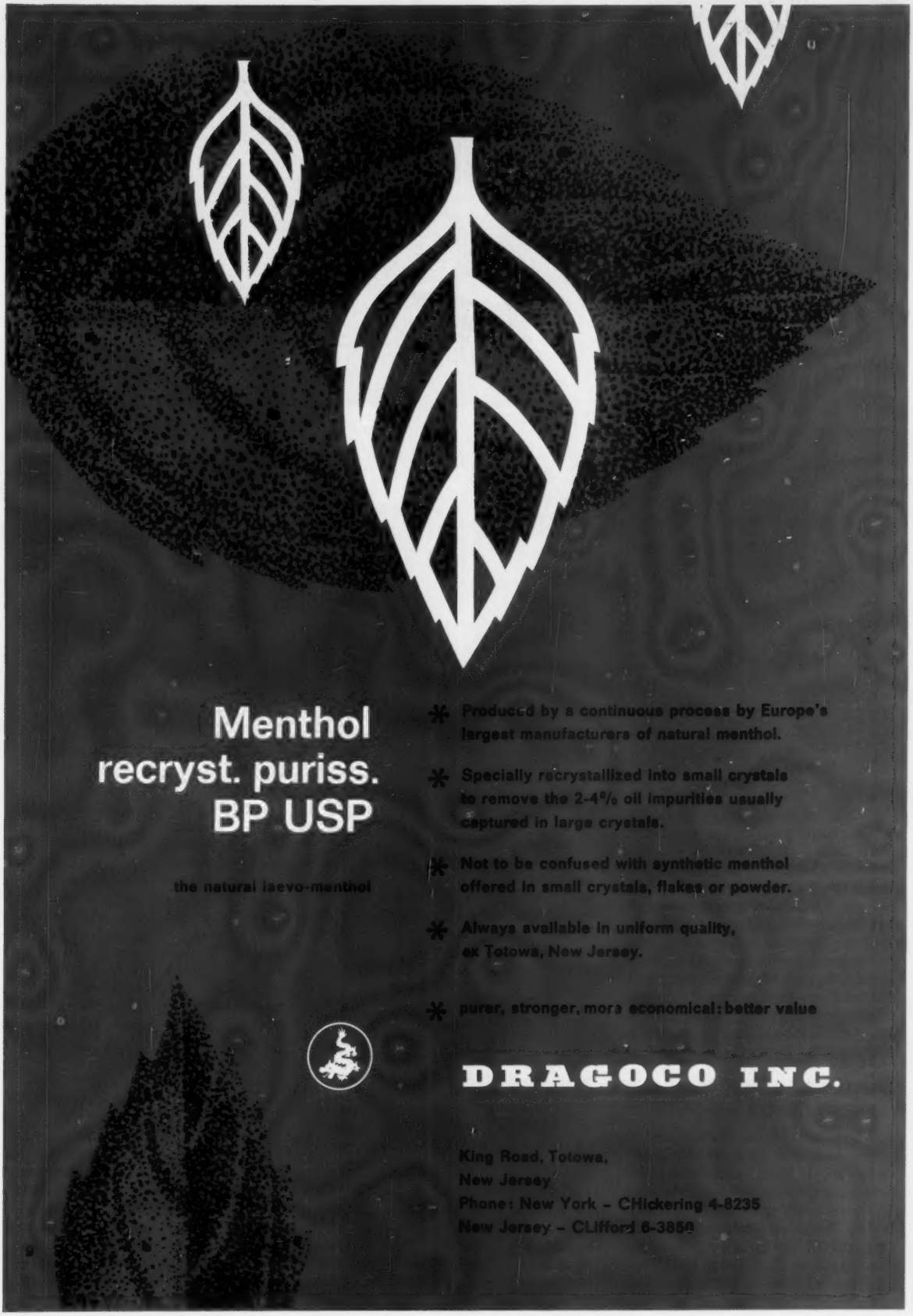
New government-controlled credit insurance program to protect businessmen against financial risk when competing with foreign companies will be pushed in Congress next year. Though type of insurance has not yet been determined, idea is supported by powerful congressmen on both sides of the political aisle.

Government investigation into food packages shifted into low key last month as industry spokesmen explained the complexities involved. Encouragingly, the testimony led Chmn. Philip A. Hart to concede that he'd like to visit food plants for a first-hand look at processor's problems.

As the second round of hearings ended, Sen. Hart indicated that label information was still a prime target. Phrases such as "3 to 4 servings" mean nothing to the consumer, he said, adding that contents should be stated in weights only. Also, he warned "weights should be stated prominently and in a prescribed place on the label." Canada's new labeling law, which does just this, is being studied by the committee.

Increasing its checks of radioactivity in foods, Public Health Service is now sampling menus in 20 boarding schools.

Looking for overseas distributors? U. S. Commerce Dept., for $10 fee, runs a trade contact survey to locate firms in a particular country who meet exporter's needs.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* Not to be confused with synthetic menthol offered in small crystals, flakes or powder.
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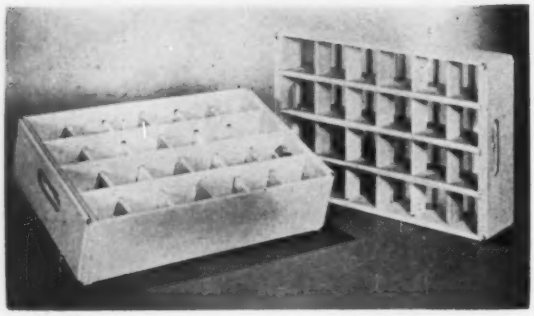
new packages

CHICKEN LIVER CARTON

NEW BIRDS EYE PRODUCTS



SOFT DRINK CASE

FOR LOW-CALORIE MARKET

SPLIT-PAK CARTON FOR CHICKEN LIVERS

Frozen chicken livers in split-pak cartons are being marketed along the East Coast by Palace Products Corp., Forest Hills, N. Y. Under the Palace brand, new package provides consumer convenience by allowing the housewife to buy two pounds of product and store one pound if not used. Previously, frozen chicken livers was sold in 8-oz. packages.

Split-pak carton is supplied by Folding Carton Div. of Stone & Forsyth Co., Everett, Mass. **(311)**

FIBRE/WOOD SHELLS FOR SOFT DRINKS

A new soft drink case, said to be the first that successfully combines solid fibre and wood for maximum service and ruggedness at lower cost, will be introduced to the bottling industry at the National Soft Drink Exposition this month in San Francisco.

Called the 24-Sell Shell, it claims these features: More economical than the traditional all-wood case; lighter than wood, with a consequent savings in delivery; almost unlimited variety of color combinations to provide better brand and advertising display; and no wire, nails, or banding to tear clothes or injure drivers' hands. Shell, produced by Container Corp. of America, can be filled automatically; cased, enclosed and palletized on present equipment; and can be intermixed with wood cases on the line. **(312)**

GF DEBUTS NEW BIRDS EYE LINE

An all-new line of eight frozen vegetable dishes, described as "the first in a long list of new products," is being launched this month by the Birds Eye division of General Foods.

Five vegetable combinations will be available in 10-oz. sizes and three vegetables with sauce in 8-oz. packages. Each will provide 3-4 servings. Vegetable combinations include green peas and pearl onions, green peas with sauteed mushrooms, corn and peas with tomatoes, green peas and celery, and fordhook lima beans with tomatoes. Vegetables with sauce are mixed vegetables with onion sauce, green peas with cream sauce, and fordhook lima beans with cheese sauce.

LOW CALORIE LINE FOR DIET MARKET

Billed as the "answer to the problems of 34 million overweight Americans who love to eat," Duffy-Mott Co.'s new "Figure Control" line of 58 different low-calorie foods is looking for a high-calorie share of the diet-conscious market.

Line is claimed to average about one-third the calories of conven-

& products

EASY-POUR MACARONI PACKAGE

BEVERAGE BASE POUCH

JAPANESE FREEZE-DRIEDS

PEANUT BRITTLE PACKAGE

tional foods, yet offers weight-watchers such tempting items as chicken cacciatore, meat balls and spaghetti sauce, and tuna newburg. Also included are fruit drinks and soups, dressings, gravies and sauces; fruits and desserts; and jellies, preserves and sweeteners.

EASY-POUR OPENING FOR MACARONI PACKAGE

New package design for Prince Macaroni products features an easy-pour opening with perforated push-in panel that eliminates the old method of cutting with knife or tearing with fingernails. Also eliminated is the cellophane window to reduce breakage and spilling while retaining flavor.

Art featuring a "New Italian Flair" is designed to give greater identification to both the name of the particular product in the box and its form or shape.

JAPAN MARKETS FREEZE-DRIED FOODS

While freeze-dried products in the U. S. have been limited primarily to such areas as ingredients for military rations, soup mixes, and meals for campers, a variety of freeze-dried items are being marketed in Japanese food stores by Japanese producers.

Most recent is Japan Instant Foods, Inc., Osaka. Firm is producing such products as egg pudding, soup, and minced meat with scrambled egg. Distribution is through C. Itoh & Co., Ltd., N.Y.C.

POUCH CONVENIENCE FOR BEVERAGE BASE

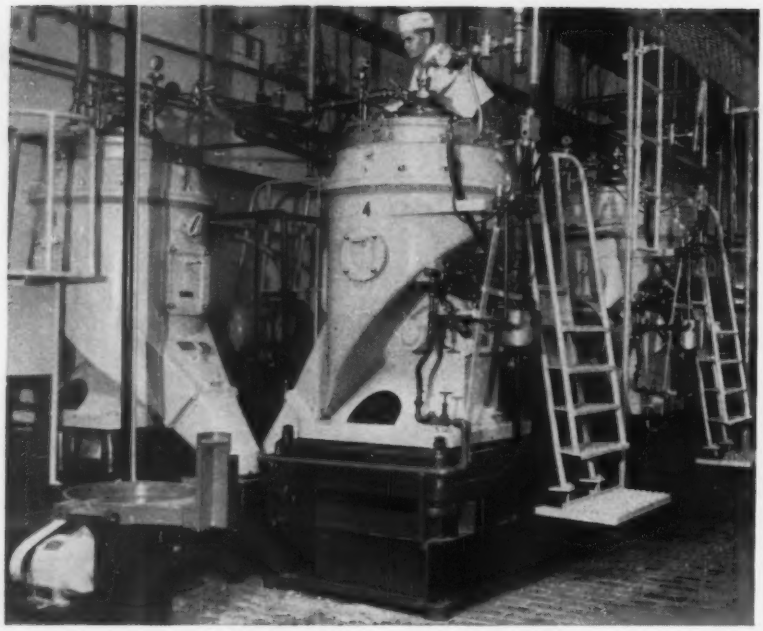
A pouch package created to condense storage requirements and add greater user convenience has been introduced for institutional Citro-Crest beverage base by California Products, Chicago. Premeasured packet is small yet holds enough lemon, grape or orange powder (12½-oz.) to make a full gallon of drink.

Riegel Paper Corp. developed the foil-paper-poly material used for the pouch. (313)

PEANUT BRITTLE MIX IN POUCHES

Do-it-yourself peanut brittle is being marketed by The Lusk Candy Co., Davenport, Ia. Product is thin-shell peanut brittle mix which utilizes the cake mix concept of three separately packaged ingredients for convenient preparation.

Three laminated pouches, each containing pre-measured compo-



How to spin more profits out of liquid-solid mixtures

Keep the liquid. Keep the solid. Either way, you'll get more *usable* product out of mixtures with the Pfaudler® Titan Superjector.

Case in point 1: An orange juice packer found that heavy finishing left undesirable pulp ingredients in the juice. Light finishing alone meant lost juice in the wet sludge.

So he installed a new procedure, using four of these Pfaudler centrifuges. Now he countercurrent-washes the pulp from a light finishing and centrifuges out unwanted particles. He gets the high quality of a single light finish *without* sacrifice in yield.

Case in point 2: A Canadian firm producing animal feed from spent grains installed a Titan to recover fines from their presswater. Result? Output of dried grain was increased with no increase in cost of raw materials. And protein content was improved to a guaranteed minimum of 30% by weight.

Best of all, this entire new system for protein fines recovery — including the centrifuge—will be paid off in 2½ years.

High separating power. The Titan gives you up to 7500 times gravity. With this power, separations are possible where the difference in specific gravity between solids and liquids is as little as 2%.

Choice of discharge. A Titan exclusive—"Select-eject" control — lets you instantaneously purge the entire bowl, bleed off solids only, or sequence these two effects as desired.

Continuous operation. The Titan has *no* nozzles to clog, no filters to blind. Instead you have automatic discharge through slots ⅜" high x 5" long, which lets you operate continuously.

Versatile. You can concentrate solids to any desired dryness up to 100% by volume, or 20 to 40% by dry weight. You can remove up to 99% of solids to get a clarified effluent with as little as 0.01% solids. You can separate two liquids and a solid, solids only slightly heavier than liquids, liquids that are viscous or aerated, particles that are fine, slimy or abrasive.

And you can do all this on a *production* basis, since the Titan gives you a capacity of up to 6000 gallons per hour.

Free bulletin. For more facts, ask for Bulletin 1002. Write to: Pfaudler Division, Dept. FE-121, Rochester 3, New York. In Canada, contact Pfaudler Permutit Canada Ltd., Toronto.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . . the science of fluid processes

nents, are packed in a cardboard box. Basic ingredient pouch is matalum, a combination of paper-foil-polyethylene; other two jackets are composed of transparent Durafilm, a cellophane/polyethylene lamination. All are heat sealed and utilize Zip-String, a thin Dacron thread embedded in the polyethylene coating of each lamination.

Complete package was designed and produced by the Dobeckmun Div. of The Dow Chemical Co. **(314)**

WRAPAROUND CARTON, developed by Container Corp. of America for Gerber Products, is reported to be stimulating sales of firm's baby orange juice through mass displays in supermarkets. **(315)**

New Product Shorts

Canned eggnog is being marketed by Nodaway Valley Foods, Corning, Ia., a subsidiary of Universal Food Products, Inc.

Seven new frozen food items have been introduced by Dulany Foods. They are Turnip Greens with Diced Turnips, Speckled Butterbeans, Lady Creme Peas, Artichoke Hearts, Baby Brussels Sprouts, Italian Cut Green Beans, and Whole Green Beans.

Grapefruit Flavor Tang Breakfast Drink is being introduced nationally by the Post division of General Foods.

Packaging Briefs

Vitafilm ST, a new shrink-tight film for packaging frankfurters, is offered by The Goodyear Tire & Rubber Co.'s Packaging Films department. It's priced at 86¢/lb. in 1-mil thicknesses and has a yield of 21,500 sq. in./lb. **(316)**

Large 24-oz. aerosol container from American Can Co. holds approximately 50% more product than the present 16-oz. model. Maker, who points out that this giant size will make it possible for a number of packers to reduce their unit selling price per ounce to the customer, will introduce the container this month. **(317)**

CIRCLE 28 ON INQUIRY CARD

CIRCLE 29 ON INQUIRY CARD →

Betty Crocker's new Potato Salad flavor-guarded by Riegel pouch-in-liner

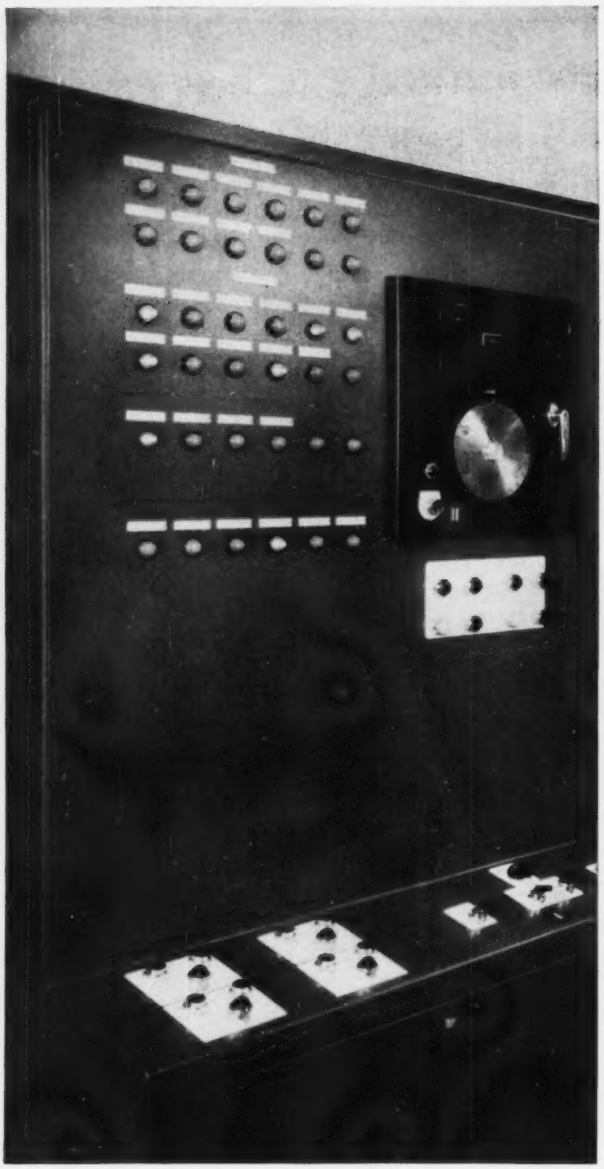
Protection for two needs in one package: For delicately flavored seasonings it's a pouch of highly protective, reverse-printed Riegel Pouchpak*. For the potato slices it's a protective carton liner of a special Riegel glassine.

Helping with the complex problems of packaging new products . . . combining protection, eye-appeal and machine efficiency . . . this is Riegel's business. We've a flair for thinking of every product as something different . . . something special . . . and developing for it the one best packaging material, be it pouch paper, glassine, foil, film . . . or combination . . . printed, coated, or plain. Write for more information today . . . for the new ideas come from Riegel.

Flexible Packaging Division
RIEGEL PAPER CORP., 260 Madison Ave., NYC 16
Flexible packaging materials for foods, drugs.

**"Pouchpak" is Riegel's registered trademark for its coated/laminated packaging material.*

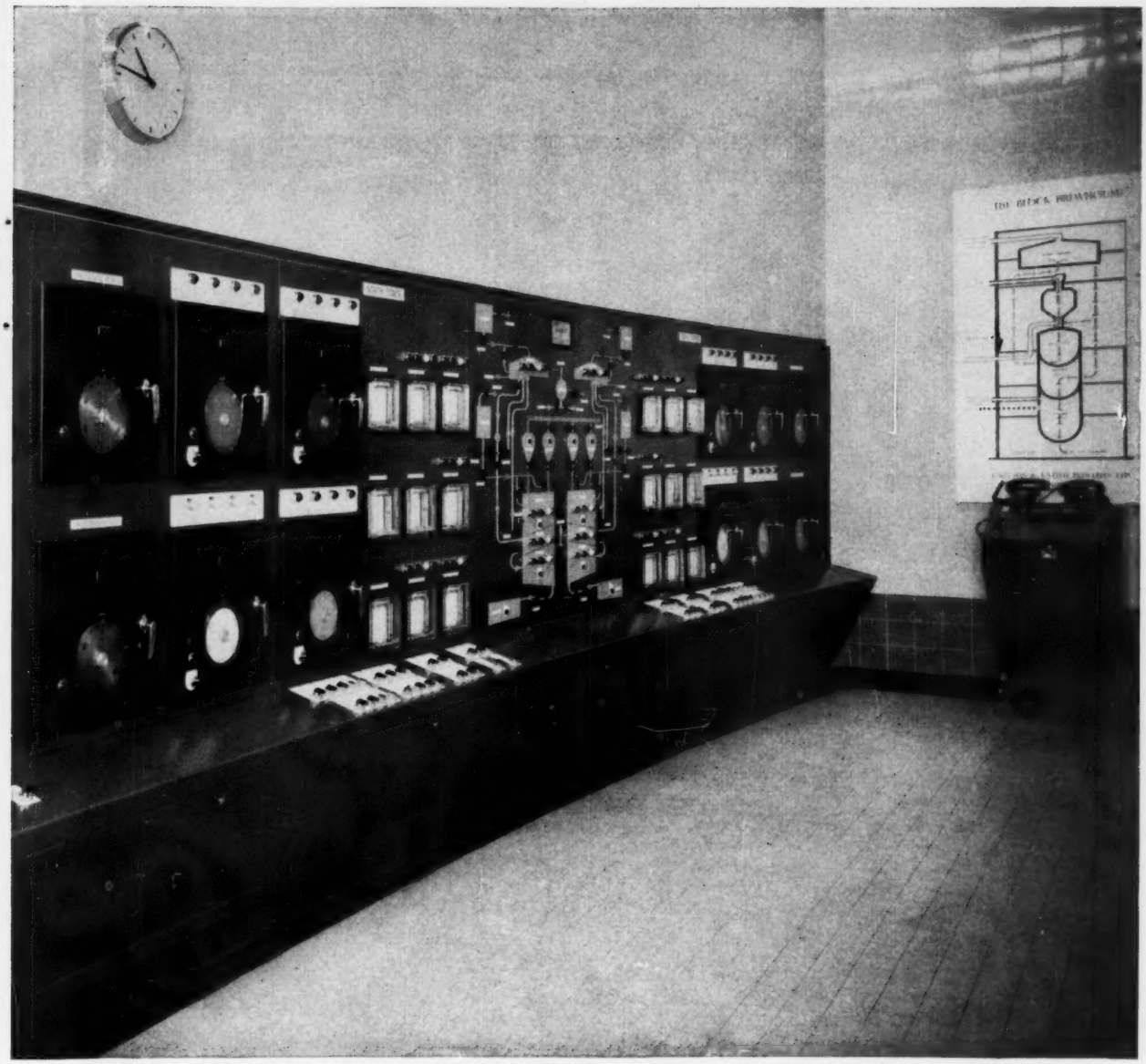
Australian brewery controls 8 brews simultaneously with advanced Taylor system



The new Block Brew Towers at the Carlton Plant of Carlton & United Breweries Ltd. represent an entirely new approach to brewing techniques. (The term "block" derives from the manner in which the rectangular processing vessels are nested above each other in their flow sequence.) The two towers employ a master timing control system that is unique in the industry. The whole brewing operation is under the supervision of a centralized panel that provides strict control of time, temperature and flow rates for eight brews simultaneously. Key to the system is the use of a Taylor FLEX-O-TIMER* Timed Program Controller as a 'master timer' (top left on panel, marked 11). Its function is to automatically sequence the four brew-cycle FLEX-O-TIMER Controllers for each of the two towers. The "master" also insures that:

1. *The mash tuns are clear and ready to receive grists and hot liquor.*
2. *The grist bins are full to the pre-set quantity.*
3. *The automatic switch is "on" for the particular tower, i.e. North or South.*
4. *Each brew cycle timer is on "automatic".*
5. *All manual stations on panel are switched to "automatic".*

Taylor Instruments



Taylor control panel for new Block Brew House comprising two 200-hogshead (420 U. S. barrels) towers at Carlton & United Breweries Ltd., Melbourne, Australia, 8th largest brewer in the world.

The brewing cycle is programmed and controlled by the FLEX-O-TIMER brew-cycle controllers and FULSCOPE* Time-Schedule Controllers (back of panel). Additional FLEX-O-TIMER Cycle Controllers are used for the lauter tun and brew kettle schedules. The miniature TRANSCOPE* Recorders (center panel) continuously record and control the process variables such as temperature, pressure, flow and load. Another new feature is that the Lauter Tun sparge and run-off flow rates are controlled to a pre-set quantity and ratio. The ratio is continuously adjusted throughout the Lauter Tun cycle.

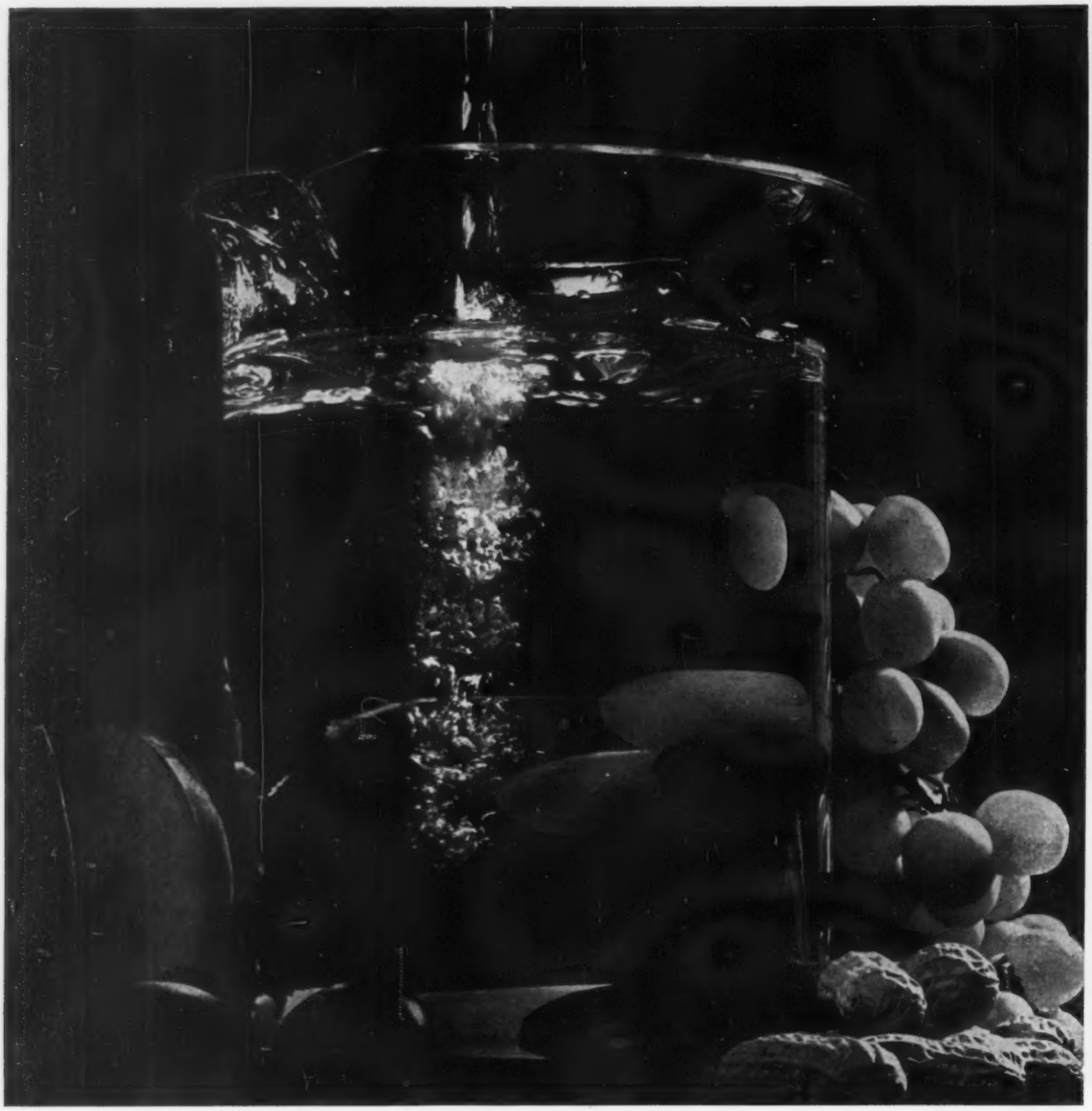
Each brew is identified by a different color light, shown above the instruments. Signal lights are position indicators of all control valves, slide-valves on the grist bins, etc. To the left of the master timer are numerous lock-out signal lights to indicate equipment that cannot be operated.

All the instrumentation shown on the panel above, plus a lot more not shown, was installed, piped and wired by Taylor Instrument Companies of Australia Pty. Ltd. This is another fine example of Taylor's world-wide facilities—and our ability to serve the brewing industry's instrumentation needs for even the most sophisticated control systems.

Call your Taylor Field Engineer for consultation any time. Or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ontario.

*Reg. U.S. Pat. Off.

MEAN ACCURACY FIRST



Maximum clarity, fastest flow rates with Celite Filtration

For products such as fruit juices, jellies, oils, syrups and wines, Celite® diatomite filter aids do the fastest, most thorough job. Because of its unique particle structure and highly irregular particle shapes, Celite filters out the most minute particles at the fastest flow rates obtainable. Product quality goes up and production costs go down.

Celite's low density means greater surface coverage per pound. Processed from the largest and purest diatomite source, it has the highest degree of uniformity in the industry, assuring you of consistent results. Celite offers the widest selection of standard and special grades giving you the exact degree of clarity needed. Today, Celite grades also include Celite perlite. For details on all, see your J-M Filtration Engineer or write Johns-Manville, Box 325, New York 16, N.Y. In Canada: Port Credit, Ontario.

Celite Division filter aids, when used as such, are not considered food additives as defined by FD&C Act Amended, Section 201(s).

JOHNS-MANVILLE • JM PRODUCTS

Wrapped Hens Hike Sales

While broiler producers wail the blues, Plus Poultry, Siloan, Ark., reports that unit-packaging frozen chickens in polyethylene has boosted sales and reduced spoilage.

Firm, which sells to institutional outlets, used to freeze 24 birds together in one cluster. Installing an MA Packaging System (Mehl Mfg., Cincinnati), firm now wraps and freezes birds individually. Customers report considerable labor savings since they don't have to thaw out block of birds, according to Pres. Jonah Mehl.

Set-up uses poly roll stock to form and heat-seal transparent wrap directly around the bird. Costing from $2,500-$5,000, the line fabricates bags at 25-30/min. rate.

Vending Packs Tested

Two different packaging innovations are used by Stouffer Corp. for frozen items being vended through gasoline stations, reveals Herb Jennings, institutional products manager. Five different shapes of melamine-impregnated paper trays (Haveg Industries), overwrapped with shrinkable Cryovac, are used for soups and casseroles. For sandwiches and pastries, molded fiber-type paper plates (Keys Co.) serve as containers.

Microwave cooking ovens used in the dispensers influenced the choice of packaging materials, Jennings says. Equally important, he adds, was appearance of cooked food in container.

Plastic Egg Carton Scores

Superior quality protection was shown by a plastic egg carton as compared to molded and chipboard versions, Cornell Univ. researchers report. Tested was a plastic carton with transparent top and aqua-colored base (made by Poly-Pak). Top and bottom halves seal each egg individually in contoured, cushioned capsules.

According to Cornell, two shipping tests showed that the plastic box "protected eggs nearly as well as do molded cartons, considerably better than chipboard cartons." Stored at room temperature, **eggs in plastic box maintained a higher quality level for longer time, and varied less in quality than product packed in regular cartons.**

Boom for Hot Melt Adhesives

New application systems will spur the growth of high molecular weight hot melts, predicts Robert S. Forsyth, National Starch & Chemical. He told last month's Packaging Institute meeting that new applicators heat the adhesive only and that they can meter the higher viscosities of the newer melts. One unit feeds the adhesive in pallet form, the other in "rope" form.

Chief advantage of the high molecular weight versions, he adds, is their greater bonding strength. **Also, by giving fast bonds on difficult-to-adhere surfaces, they're well suited to high-speed production lines.**

Packaging Pointers

See-through egg box . . .

Hot melts to advance . . .

Linerless aluminum can

Linerless Aluminum Can

No interior coating is necessary for aluminum cans containing most frozen juice concentrates, claims P. C. Althen, Alcoa's technical manager-rigid containers. Fresh orange concentrates (as well as grapefruit, grape, lemon, and lime) produced virtually no reaction with uncoated aluminum when stored at room temperatures, he says.

BRIEFS

Will food companies go into captive film-making? Question has become a hot topic in food industry following reports that two midwestern confectioners are considering installing converting facilities in their own plants.

Soft drink can output will reach 1.8-billion units in '62, 50% more than the estimated 1.2 billion expected this year, predicts Continental Can. One helpful factor: Lightweight tins will be priced 2¢ less per case of 24s.

Scuff-proof labels on Canada Dry's 28-oz. bottles feature a recessed "panel" which offers protection from tearing.

Portion control packing of jams and jellies in ½- to 2-oz. foil cups has been started by Musselman, using new Ekco-Alcoa filler-capper unit.

Non-returnable beer bottles shipments increased 39.7% the first 9 mos. of this year, according to Glass Container Mfrs. Institute. One-way soft drink bottles soared 68.5%.

Dried fruits are first item to be used in new type of Mylar (polyester) film that's been tailored for make-and-fill equipment, according to Du Pont. Coated on both sides, film is treated to eliminate sticking on crimp-seal jaws, and can handle up to 2 lb. of dump-fill product.

"Our USS Cyclone conveyor belts have paid for themselves many times over,"

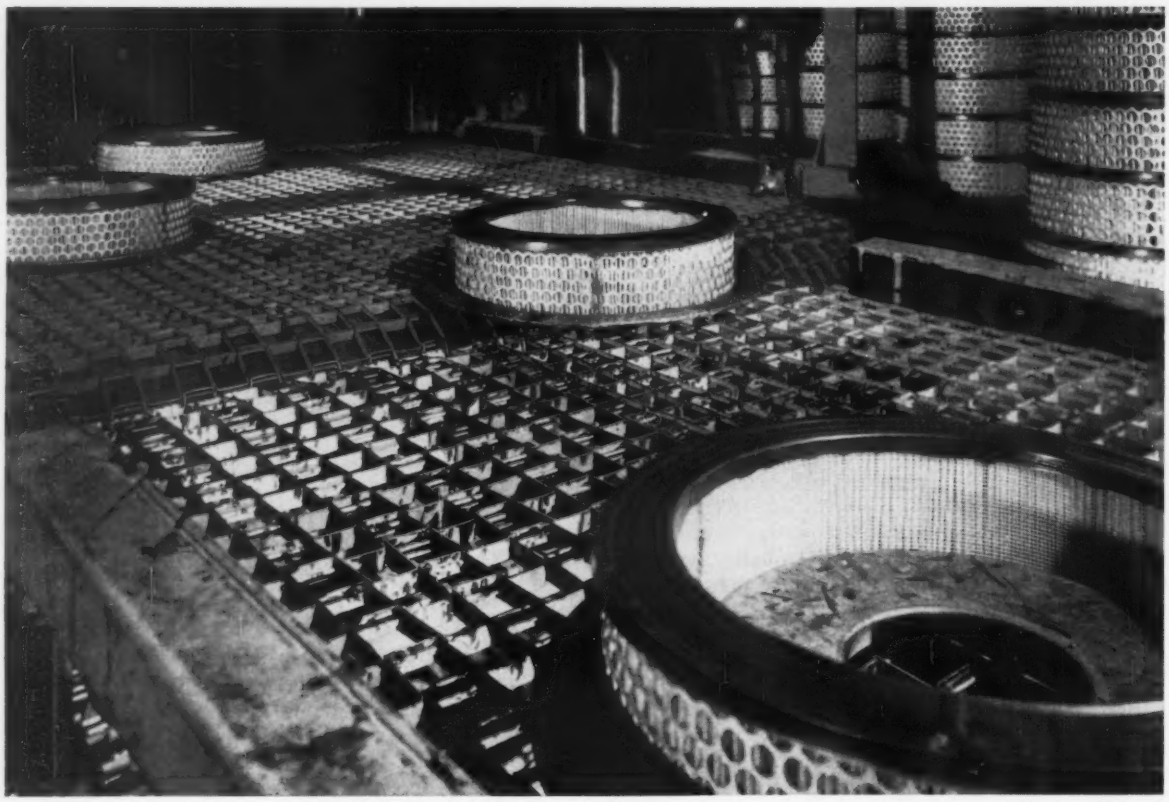
says Herb Otto, vice-president and chief engineer, Lee Filter Corp., Edison, New Jersey

"Conveyor belts are the blood lines of our filter production setup. If they go down, we're dead. Every year 20 million dollars worth of filter business rides on the ability of these belts to keep rolling. In five years Cyclone flat wire belts haven't let us down. We expect a lot from them. They've got to keep moving 16 hours a day, 12 months out of the year. Our belts are sprocket-driven and we've had little or no maintenance on them. We feel our Cyclone flat wire belts have paid for themselves many times over."

Chances are Cyclone has a belt which could improve your production. USS Cyclone makes more kinds of metal conveyor belts than anyone else in the world. Our service is the fastest in the industry. We have 66 branch offices around the country to serve you. Wherever you are, we're reasonably close. Next time you need a metal conveyor belt recommendation, give us a call. Check your Yellow Pages under "Conveyor Belts—Metal."

USS and Cyclone are registered trademarks

This mark tells you a product has the dependable strength of Steel.



American Steel and Wire Division of United States Steel

Cyclone Sales Offices Coast to Coast

Tell Food Story to Public—in Big Way

Public confidence in the food industry is being undermined by food faddists, quacks, sensation seekers, politicians and government agencies.

Only through an informed public can confidence be restored.

It follows then, that the recent annual GMA meeting was on the beam. Its theme was "The Food Industry . . . Its Contributions and Continuing Public Responsibilities."

President Paul Willis and other speakers pointed to great industry achievements that are in the public interest. Among them: 1. Thousands of new products. 2. Improved nutrition, taste, variety, reliability and safety. 3. Time-saving convenience. 4. Reduction in cost of food relative to personal income.

Food men talking to themselves

Trouble is that the food men were talking to themselves. A necessary beginning, this in itself is not adequate.

Where do they go from there? GMA is helping to bring the story of food to teenagers through the National Youthpower Conference. It is cooperating in the Fifth International Food Congress. To be held next year in New York, this affair can have an influence through the exhibits and news stories.

GMA also is sponsoring a Food Forum, attended by some 300 prominent American women especially interested in food. Nutrition Foundation has expanded its public information program to combat faddists.

All are highly commendable. Yet, compared to the total daily contacts of the industry with the public, the numbers reached are very small.

Needed, for one thing, are more articles telling the tremendous story of food in national consumer magazines. The one in *Look* about costs is an excellent example. We believe editors of more magazines would see good copy for readers if someone took the trouble to give them the facts. The food story is fascinating—it has universal appeal—it is of basic importance—it can interest virtually every reader.

Tell it to public via commercials

But the industry can get its story across in other ways. If pace-setting food manufacturers used just a bit of their advertising to mention industry achievements, the exposure would be terrific. A cake mix commercial, for instance, might say: "This mix makes cake making a breeze. It is one of the food industry achievements that give homemakers 4 hours more leisure every day."

George Jenkins of Public Super Markets suggests talking to consumers via food packages. Think how many times messages could be delivered daily through this medium. Then there are point-of-sale posters, company house organs, factory bulletin boards, and delivery trucks. Even restaurant menus offer opportunities.

To quote Carnation's Ralph Brubacker: ". . . our industry richly deserves an end to the undermining of public confidence through ill-advised, politically inspired harassment . . ."

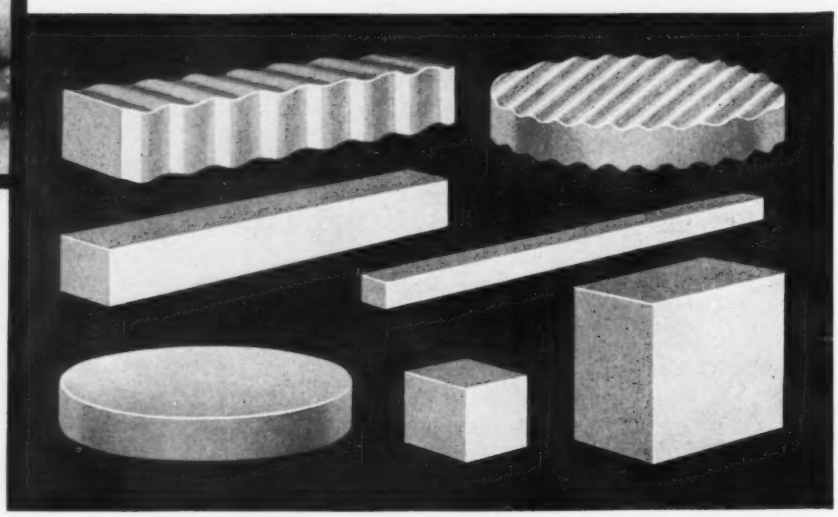
Achieve this end through an informed public.

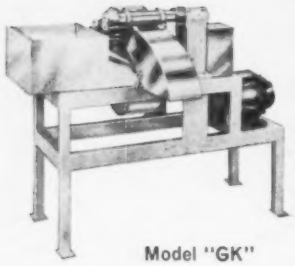
Now you can cut more POTATO shapes and sizes with the Urschel Model GK*

Corrugated French Fry Cuts (3 sizes) 7/16" - 1/2" - 9/16"
Straight French Fry Cuts (3 sizes) 3/8" - 7/16" - 1/2"
Julienne Cuts (3 sizes) 5/32" - 3/16" - 1/4"
Corrugated Slicing – any thickness to 3/4"
Straight Slicing – any thickness to 3/4"
Dices (3 sizes) 3/8" - 7/16" - 1/2"
Specials – many shapes and sizes of plain and corrugated cuts

Other Food Products—The Model "GK" was designed expressly to make tempting corrugated cuts on potatoes. It will produce excellent potato straight cuts, too, but is not recommended for other food products. For straight cuts on other products to sizes listed, request full information on the Urschel Model "G".

The "GK" precision-cuts potatoes up to 11 tons an hour . . . *gently*.





Model "GK"

For detailed information write:

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

VISIT URSCHEL BOOTH #102, CANNERS NATIONAL CONVENTION, MACHINERY HALL, AMERICANA HOTEL, BAL HARBOR, MIAMI BEACH, FLORIDA, JANUARY 21-24, 1962.

FOOD · PRECISION HIGH-SPEED CUTTING EQUIPMENT ·

* New alternate parts are also available for your present Urschel Model GK —enabling it to cut all these shapes and sizes, too.

Designers and manufacturers of precision, high speed cutting equipment for food products.

FOOD ENGINEERING

SYMPOSIUM on freeze-drying foods was attended by 400 technologists from 12 countries. FD activity is fast becoming world-wide.

London Freeze-Dry Symposium

Experts analyze progress and problems in equipment, freezing, heat application, vacuum, vapor removal, control, rehydration, and nutrition

ADVANCES and problems in all phases of freeze-drying foods were discussed at a two-day international symposium in London, Oct. 19-20. Four hundred technologists participated in the Borough Polytechnic meeting, including 40 from 12 countries outside England. Activity in freeze-drying food is fast becoming world-wide.

"Progress in Freeze Drying in America," was reported by FE's Editor. Principal points covered were reported in Nov. FE, p. 35.

Dr. R. I. N. Greaves, Department of Pathology, Cambridge, observed that radio-frequency heating does not look too promising for the early part of a cycle, but might be satisfactory toward the end. Local thawing occurs with r-f.

With radiant heating, the surface dries first, and the dry material is easy to overheat. If the dry surface can be removed as powdered material, drying by radiant heating can be speeded tremendously. Drying temperature can be maintained without impairing quality.

Much heating occurs by convection, Dr. Greaves believes. And he favors use of a controlled air leak, or air injection, which may speed drying as much as three times.

Heating and drying both sides of product simultaneously cuts the time to one fourth, this being done in Europe's "Accelerated Freeze Drying."

Spiked plates, Dr. Greaves reported, have been used in Canadian freeze-drying experiments. These speed the process by conducting heat into the food, but the plates are expensive.

To achieve a quality product, drying temperature must be maintained below the eutectic point —a problem in many foods. Sodium chloride, for instance, forms a eutectic with water. In orange juice the eutectic temperature is —25C. (—13 F.). Above eutectic, drying is from the liquid phase. This is not freeze-drying, and quality suffers. In the case of orange juice, a tacky plastic mess is produced. Dry below the eutectic point, however, and you have a good, dramatically different product, Dr. Greaves stated.

It is important to so control the process that no ice crystals are left in the final product. Cutting cams to control the process automatically,

FRANK K. LAWLER, Editor, "Food Engineering"

AUDIENCE PARTICIPATION through comments and questions enriched symposium. Here John F. Macguire, F. J. Stokes, Philadelphia, contributes information.

SPEAKERS ANSWER questions. They are (l to r) from Atlas, Mitchell Engineering, Vickers-Armstrong, FE, and Leybold-Elliott.

according to a predetermined cycle, is one way to meet this requirement. Leybold has developed a control, the Tempomatic, based upon vapor pressure in the dryer. When a product is dry, there is no rise in vapor pressure in the chamber when the vacuum valve is closed.

To save time, drying must be done near the eutectic point. A thermocouple in the product can be used to cut off the heat as the temperature of the product reaches the upper limit.

To protect the finished product from deterioration by oxygen, Dr. Greaves recommends breaking the vacuum with nitrogen at the end of the cycle. Otherwise air is trapped inside the spongelike product. And some air remains in the product even if the package is evacuated before nitrogen is introduced. Fats in the food then go rancid quickly.

If the drying chamber is broken with nitrogen, the product can be handled in air, before vacuum-nitrogen packaging

Vacuum System Pointers

T. W. G. Rowe, Edwards High Vacuum, Ltd., reported working with a vapor absorber—ethylene glycol. It provides about the same rate of water vapor take-up per unit of area as refrigerated plates. Water vapor is removed from ethyleneglycol by heating and passed into a water-cooled condenser.

In building freeze-drying vacuum chambers, double welds (inside and out at the same joint) should be avoided. Such welds make leak detection very difficult compared to single welds. O-ring seals are satisfactory in the vacuum equipment.

Vacuum pumps should be of the water-seal type. With an oil seal, water vapor in the pump emulsifies with the oil. An air purge will avoid this problem, however.

Mr. Rowe observed that water vapor complicates measurement of vacuum in freeze-drying. The McLeod gage is useful, but requires an hour for an accurate reading. Refrigeration can be used to condense the vapor for a true air pressure measurement. A thermal gage—heater filament—is suitable if calibrated against a McLeod gage, according to Mr. Rowe. But it is not terribly accurate with mixtures of air and water vapor unless the mix is known. An ionizing gage gives a fairly accurate total pressure reading.

J. C. Forrest, Corn Products Co., discussed the development of AFD at Aberdeen. Use of expanded metal between dryer heating plates and product cut drying time 40%. Best results are with the pointed side of the metal against the product and 1 mm. penetration to speed heat transfer. Application of heat to both sides of product in AFD gives more uniform drying. And with this system a plate temperature of 140C. (284F.) can be used at the start of the cycle without raising product center above 0C. (32F). Temperature is reduced as drying proceeds.

It now appears that much of the acceleration achieved at Aberdeen stems from the higher initial temperatures, Mr. Forrest said.

For vegetables, pretreatment is similar to that for air drying, but thicker pieces are permissible. With meat, how it is cut is important. Rate of moisture vapor escape is faster along muscle fibers than across them, so fibers should be at right angles to heating surface.

Freezing prior to drying at —10C. (14F.) forms large ice crystals that break up fibers in the product. Result is quick reconstitution, but a product that won't hold the water. —40C. (—40F.) is considered most satisfactory.

Fastest freezing was achieved at Aberdeen by evaporation under vacuum in the freeze-drying chamber. But reconstitution was slow.

Freezing in the dryer removed about 20% of the moisture from the product and shortened freeze-drying time. So evaporative freezing is recommended where it is suitable. It is limited to products with large surface area and easy vapor escape.

Stew made at Aberdeen was frozen into blocks, sawed into uni-

AFD Foods Tasty

We had the pleasure of tasting a wide variety of foods processed by Accelerated Freeze Drying at Vickers-Armstrongs, South Marston, Eng.

Chicken, seafoods, fish, eggs, vegetables and fruits were among those eaten. Every food tasted good, some excellent. Color was satisfactory. Texture and "mouth feel" were good, except for rather limp pickled beets. There were no off-odors.

In general, it may be said, however, that freeze-dried foods are usually not the exact equal of fresh in "crispness" of texture.

AFD codfish stored for 10 months in inert gas still was good.—FKL

form slabs, and freeze-dried.

To protect fragile foods from crushing between squeeze plates of the dryer, Aberdeen used an electrical spacing indicator. An icicle with a thermocouple in it determined partial pressures fairly accurately. In using the McLeod gage silica gel was employed to remove water vapor and increase accuracy.

The AFD drying cycles shown in charts range from 6 to 7½ hr.

How To Speed Heating

B. C. Walker, A/S Atlas, pointed up factors involved in heat transfer. Heating with dry gas has been suggested, but is not suitable for commercial practice. The gas volume required is excessive.

Microwave heating seems attractive at first sight. It can overcome slow transfer of heat through the dry outer material. But the dielectric loss factor varies in non-uniform foods and high temperature zones develop. This melts the ice, sometimes with disastrous results. Formation of vapor inside a product can virtually explode it.

Also, ionized gas can cause scorching and discoloration of food. Temperature control is very critical, too. And temperature is difficult to measure with microwave heating because of the hardware involved.

Infra-red heat has been tried by Atlas, but it scorched the outer layer of the food.

Control of heat input is a problem. Color affects absorption, and color varies. Heat input depends upon the 4th power of the temperature.

A temperature of 80 to 85C. (176 to 185F.) on surface of product can be tolerated at start, because of cooling effect of escaping water vapor.

Spikes speed drying, but require extra labor to strip them from product. Ribbed trays cut time 10%, but are more expensive and pose a cleaning problem.

Best, in Mr. Walker's opinion, is a combination of radiation with conduction by using expanding metal plates, as in Europe's AFD. But there still is a long way to go before optimum drying rates are achieved, he believes. And it is difficult to reproduce processes accurately. Nevertheless, amazing advances have been made in a relatively short time.

E. G. B. Gooding, Corn Products Co., stated (in a paper presented by an associate) that freeze-dried vegetables with 2% moisture can be stored four times as long as air-dried having 5% moisture. These will keep 2 yr. if properly packaged in inert gas inside a container impervious to gas, light, and moisture vapor.

Proper Reconstitution

Miss A. L. Brown, Royal Naval Scientific Service, discussed problems of reconstitution. It is important that methods for reconstituting be practical to the housewife. And rehydration should be combined with cooking.

Raw meat and fish are better if reconstituted in cold water. Hot water toughens and imparts a "twice cooked" flavor. With vegetables, however, the only difference between hot and cold water is the time of rehydration. Fruits require some cooking for adequate water uptake.

Raw freeze-dried meat is immersed in cold water until soft (5 to 15 min.). And dehydrated meat is best wet-cooked, although it can be grilled or fried. Pressure cooking is permissible. With stews, gravy should be added at the end to avoid slowing reconstitution.

Fish rehydrates in cold water in 2 to 5 min. It then may be poached or cooked in the normal manner.

Vegetables rehydrate best in boiling salted water (2 to 5 min.). Then they are cooked 3 to 10 min., drained and served. Potato pieces are soaked 5 to 10 min., dried, and fried. Fruits are generally put into boiling water 2 to 5 min. and allowed to simmer 1 to 10 min. Complete dishes are soaked up to 5 min. and simmered up to 15 min.

AFD foods are first rate, says Miss Brown. And it is up to the cook to overcome prejudices against dehydrated foods.

New Freeze-Dry Book

Just off the press at the time of the Symposium in London is the book, "The Accelerated Freeze-Drying (AFD) Method of Food Preservation."

It reports practical findings of research in the laboratory and experimental factory of Ministry of Agriculture, Fisheries and Food, Aberdeen, Scot., between 1955 and 1960.

Engineering, economics, and technology are covered. The latter ranges from raw material selection, through preparation, to quality control. There are chapters on storage behavior, reconstitution and cooking, and nutritive values.

Book is available from York House, Kingsway, London, W. C. 2, Eng.; price, 12s 6d net (about $1.75).

FE EDITOR SPEAKS at symposium on "Progress in Freeze Drying in America." Lawler reports highlights on conference in this article, with more to follow. See Nov. FE for points from his talk.

Pointers From Users

C. G. Tucker, Irish Sugar Co., observed that raw materials for freeze-drying should have high solids content and full flavor. And researchers in agriculture should take these requirements under study.

E. J. Rolfe, Unilever Ltd., said that for fastest drying, meat should be cut so that the fibers are parallel to the direction of moisture vapor exit. With fish, water vapor can get out either way. But cod fillets dry slowly and are preferably cut into transverse sections. Thermal conductivity of cod is 0.4, that of steak, 0.37, the difference being too small to account for the difference in drying rate.

Evaporative cooling, Mr. Rolfe believes, is satisfactory for any product with a large surface area and easy vapor passage. It applies to cooked meat products and thin fish, but is not recommended for steak. To get large ice crystals and speed freeze-drying, rate of freezing is reduced. This doesn't harm meat, in Mr. Rolfe's opinion. But it would degrade fish and result in opaque tissue upon thawing. Fish must be quick frozen.

If the fatty tissue in meat melts in freeze-drying, it can block the tissue openings for vapor. Then local overheating and drying from liquid phase results. Hamburgers, however, freeze-dry rapidly and very uniformly. (End)

How Industry Economists View '62

	1961	1962	
	Est.	1st Half Est.	2nd Half Est.
	(Billions of Dollars, Annual Rate)		
Gross National Product	521	544	555
Disposable Personal Income	361	379	385
Personal Consumption Expenditures	336	350	356
Food-Beverage Outlays	81.5	83.3	84.2

Food Outlays Up 3% in '62

Industry economists see bigger population, rising income lifting food spending to new high. But price pressures to worsen

FOOD MAKERS will have another record market to shoot at next year, a FOOD ENGINEERING poll of industry economists indicates. These analysts look for a 2.8% increase in consumer outlays on food-beverage products. They see food-beverage expenditures rising from the current $81.5 bill. annual rate to $83.3 bill. in '62 first half, then to $84.2 bill. rate in the second half. (Alcoholic drinks usually account for $9-10 bill. of this total.)

Behind this confidence is the expected uptrend in the two key factors that influence food spending—population and personal income. Continental population, averaging a 1.8% annual increase the past 5 yrs., is expected to show a comparable rise in '62. And disposable personal income, food industry analysts say, will climb 5.8%—from present $361.3 bill. rate to $382 bill. Furthermore, they feel that personal consumption expenditures will perk up 5% next year, reaching an annual rate of $353 bill.

Costs Up Again

Based upon the analyst's projections, it's evident that food will be up against stiffer competition from other goods and services in '62. **With bigger increases forecast for income and total outlays, food spending as a share of income could drop from this year's 22.6% to 21.8%; as share of expenditures, it could dip from 24.1% to 23.5%.**

As food makers move into 1962, they face no let-up in the cost squeeze that has boxed them for years. Marketing charges next year, predicts USDA, will average 1-2% higher per unit of product. Average hourly earnings are likely to continue rising, the department feels, but improvements in output per man-hour should act as a brake on increased unit labor costs.

This year, hourly gross earnings in food plants crept up another 2.7%—from $2.15/hr. to $2.21. However, rough price competition kept wholesale prices of processed foods at the same 108.1 index level they were a year ago.

Costs of equipment and supplies showed a mixed picture this year. Food makers paid higher prices for the following: Cans, up 2.6 percentage points; lubricating oils, 3.1; utilities, 1.6; construction, 1.3; and gasoline, 3.1. On the other hand prices for the following items downtrended: Glass, down 0.9 points; machinery, 0.8; container board, 8.9; trucks, 0.1; and tires, 0.4.

Faced with rising costs, compounded by a high degree of obsolete equipment, food makers are planning a capital spending splurge in '62. Lionel D. Edie, an economic consultant, looks for a hefty 26% surge in capital outlays by food-beverage firms—rising from an estimated $980 mill. in '61 to $1,230 mill. in '62. McGraw-Hill's annual check points to a 6% upsurge by food firms. Significantly, both surveys put food-beverage outlay above the $1 bill, mark, first time since '48.

Chances are that a good chunk of this spending will be for modernizing operations. It's generally agreed that there is sizable excess capacity in the industry. A Federal Reserve Bank of Philadelphia survey shows food plants operating at 84.6% of capacity, a McGraw-Hill check indicates 82%. An FE survey back in '58 revealed that 58% of the industry's processing capacity was then over 10 yrs. old—

THAYER C. TAYLOR, Associate Editor, "Food Engineering"

as against 48% for all-manufacturing. These two facts, plus the need to reduce labor costs, point to a greater outlay for modernized equipment.

An added inducement to plant modernization, many feel, is the likelihood that today's rough price competition will be intensified in the months ahead. This view is based on population trends, which show low income groups growing four times faster than higher income households the next several years. As a result, it is said, price-conscious consumers will play a greater role in food buying and will find lower-price private labels more attractive than advertised brands. A recent USDA study indicates that customers are reaching "the conclusion that the price spread between private and advertised brands is large enough for them to forego the small quality difference that may be noticeable."

Burgeoning low-income families will also make discount stores a bigger factor in food retailing in the future, thus adding to the pressure to keep prices low. These outlets, reportedly, already do $2 bill. a year in food sales, may quadruple that by '65.

How Industry Branches Will Make Out

FOOD MANUFACTURERS will have a rising economy working in their favor in 1962. That was the broad picture painted by USDA's experts at last month's Outlook Conference. In brief, USDA sees a continued rise in consumer expenditures on eats-and-drinks, abundant supplies, relatively favorable prices, and a possible gain in per capita consumption. Zeroing in on specific industry segments, here's what USDA's experts foresee:

MEAT

Production will set a new record at 28.6 bill. lbs. this year, will reach a new high next year at 29.3 bill. lbs. This will lift per capita consumption from 160.6 lb. in '61 to 161 lb. in '62.

Beef production in '62 should move up 3%. But a 4% bigger cattle slaughter will pull prices down, especially for Canner and Cutter cows. Price weakness will be less pronounced for Utility and Commercial stock. Pork prices will hang on the Spring pig crop. An increase in the 3-4% range will keep prices steady, but anything bigger than that will depress prices.

DAIRY

Milk production, up 2 bill. lbs. to 125 bill. lb. level in '61, will score a similar gain next year. Although bigger CCC-distributed quantities of dairy products may lift total consumption in '62, per capita intake will show little change. Except for American and other cheeses, commercial demand for dairy items dropped sharply this year. Sales of butter and fluid milk dipped to a 4-yr. low. Greater home consumption of nonfat dry milk was unable to offset fall-off in industrial use (which accounts for 80% of overall consumption of the product). Consumers will continue to shift from products rich in milkfat to those rich in non-fat solids.

Prices to farmers and consumers should remain steady through March 31. After that, the new price supports (to be announced later) will call the tune.

CANNING FREEZING

Canned fruit pack of '61-'62 marketing season shapes up moderately larger than heavy '60-'61 output (87 mill. cases of 24/2½s), and may even equal or top record '59-'60 pack (91 mill. cases).

Output of frozen fruits and juices this year will be well over the 1.6 bill. lb. packed in '60. Strawberry acreage may be 4% larger in '62. Florida's orange crop is pegged at 99 mill. boxes in the '61-'62 marketing season, compared to 86.7 mill. boxes last year (when 84 mill. gallons of frozen orange juices were processed). Florida Citrus Mutual, incidentally, sees upcoming frozen orange juice sales topping 90 mill. gallons.

Supplies of canned vegetables are moderately larger than last year as the result of heavy packs which cancelled out this summer's smaller carryover. A heavy pack of frozen items, piled on top of larger carryovers, has produced record supplies. Estimated total output of 8 important vegetables for processing was up 10% this year. As a result, consumption should climb slightly in '62.

Opening prices on new-pack canned goods have been averaging same to slightly higher compared to year-ago quotations, but frozens have felt the supply pinch.

Export prospects for canned fruits and vegetables continue to look favorable as result of reduced import restrictions.

POULTRY

Heavy production and low prices will dominate here. Broiler output reached 2.0 bill. birds this year, 12% more than in '60, and may show another (but probably smaller) increase in '62. As for turkeys, 107 mill. birds were raised this year vs. 85 mill. in '60, and signs point to another large crop in '62. Recent prices—17.4¢/lb. for turkeys, 11.7¢ for broilers—were lowest since USDA began keeping records back in '40.

USDA is holding hearings on proposed marketing order for turkeys, as authorized in the new farm bill. However, even if growers vote for it, program won't affect prices before latter part of '62. Until then, prices are likely to follow present levels, especially in view of fact that cold storage stocks at the start of the new year may be as high as 300 mill. lb. (as against 160 mill. lb. a year ago). This hefty jump in freezer supplies represents more than 10% of annual output.

BAKING

Total wheat supply in '61-'62 marketing season, at 2.6 bill. bushels, will be 2% below last year's record level. Slightly larger supplies will characterize hard red winter class, used for bread flours, and soft red winter variety, used for pastry, crackers, biscuits, and cakes. Hard red spring wheat, also used for bread flours, will be down, as will durum wheat that goes into spaghetti and macaroni products. Prices of hard red spring and durum wheats have been pushed up by drought-reduced crops. Recent increase in price support for wheat, from $1.79/bushel to $2, means bakers will have to pay out $60 mill. more for flour this season, according to American Bakers Assn.

To stimulate production of hard bread wheats, USDA will offer premiums based on sedimentation tests in place of the current protein bonuses.

FATS, OILS

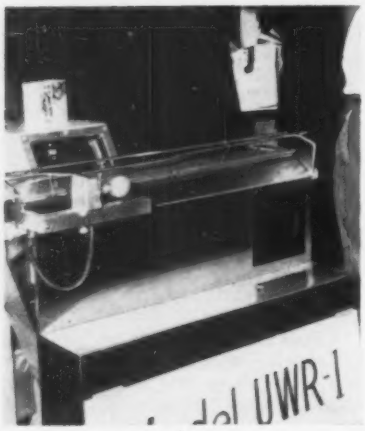
Total supply of food fats and oils in '61-'62 season is pegged at record 16.1 bill. lb., 15% over year-ago levels. Lard output may increase 5% to 2.6 bill. lb., with 100 mill. lb. going to margarine producers and as much as 650 mill. lb. to shortening manufacturers. Latter will shift from costlier edible oils to lard, whose prices will probably dip from 10¢/lb. to 9¢.

Per capita usage of food fats in '62 will probably continue at annual 46-lb. rate. Civilian peanut consumption in '62 is expected to remain around 6.5 lb.—with 5.5 lb. for peanut butter, salted nuts, and candy.

PMMI Show Accents

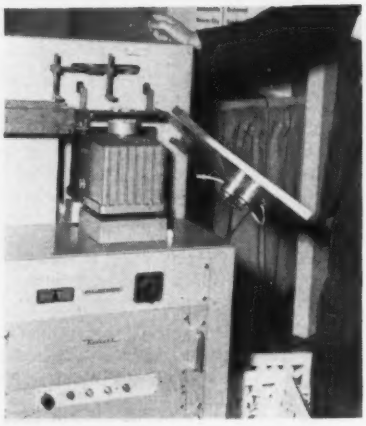
Packaging exhibit at Detroit features striking

4 WEIGHT-FILL-CHECKERS



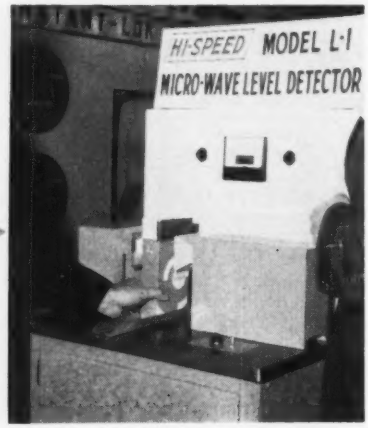
UNDERWEIGHT REJECTOR utilizes mechanical-optical torsion weigh system and flipper-type reject. Package breaks electronic circuit's interlock beam, with weight information transferred from weigh cell to reject solenoid. Overweights handled as on-weights.—Illumitronic Systems Corp., Sunnyvale, Calif. **(451)**

CHECKWEIGHER operates at capacities up to 90 packages/min. in 1/32-oz. to 2-lb, range. Employs sensitive spring scale with accuracies from 2 mg. to 1g. and signal from control unit to operate solenoid reject. Rejects packages into 2-10 groups.—Mettler Instrument Corp., Princeton, N. J. **(452)**



HIGH-SPEED UNIT automatically checkweighs pouches, cans, jars and cartons "on the fly" at speeds up to 300/min. Tolerances adjustable and maintained within accuracies of $\pm\frac{1}{2}\%$. Packages whisked across scale platform, then discharged to reject mechanism. — FMC Corp., Philadelphia. **(453)**

MICRO-WAVE LEVEL DETECTOR provides signal if carton's product level is below standard and operates reject unit when used in conjunction with checkweigher. Detector senses given level within $\frac{1}{8}$-$\frac{1}{4}$ in. It employs micro-wave signal generated by Klystron power oscillator at 10,000-megacycle frequency. —Hi-Speed Checkweigher Co., Inc., Ithaca, N. Y. **(454)**



2 LONG-CUT MACARONI PACKAGERS

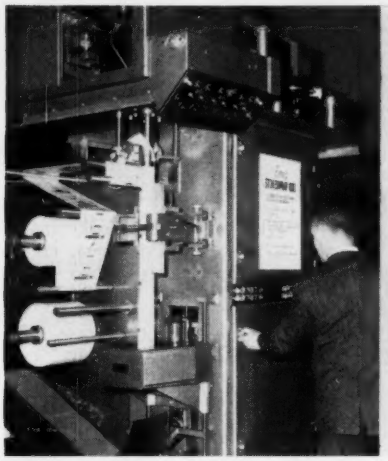
AUTOMATIC MACHINE weighs and packages macaroni and spaghetti in cellophane or polyethylene (roll-fed). It comprises specially-designed scales along with bag shaping, filling and sealing units. Speeds up to 35 packages/min. — Amasco, Inc., Chicago. **(455)**

WEIGHER-WRAPPER bulk measures, scales long-cut goods to final weight and deposits macaroni onto roll-fed and cut film for final conveying to 3-station sealer. Machine operates at speeds up to 30 packages/min.—Triangle Package Machinery Co., Chicago. **(456)**

Speed, Efficiency, Accuracy

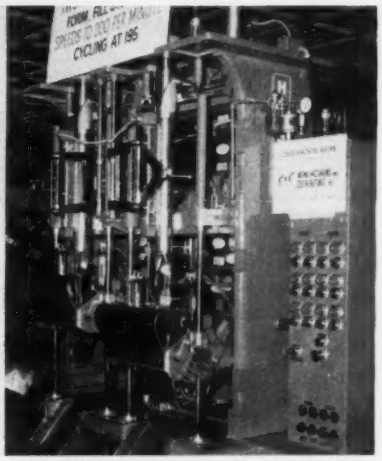
equipment advances for better, faster line performance

3 POUCH FORMERS-FILLERS-SEALERS



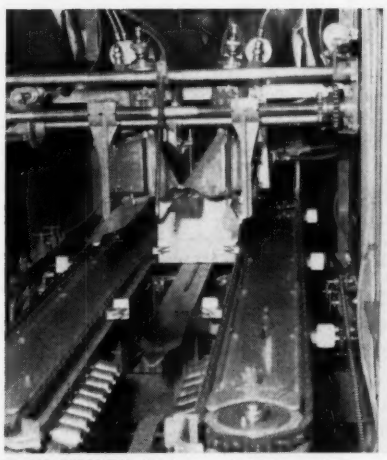
DOUBLE-TUBE unit has advantages of two single-tube machines at less cost, operates by pocket feed- and net weight scale-methods. Permits simultaneous running of different products, films, sizes and speeds up to 150/min.—FMC Corp., Philadelphia. **(457)**

VERTICAL form-fill-seal machine produces tetrahedron-shaped packages from variety of heat-sealable roll-fed material. Unit handles powders and liquids to form unit-of-use packages in 1/8-2 oz. sizes.—Bemis Bro. Bag Co., St. Louis, Mo. **(458)**

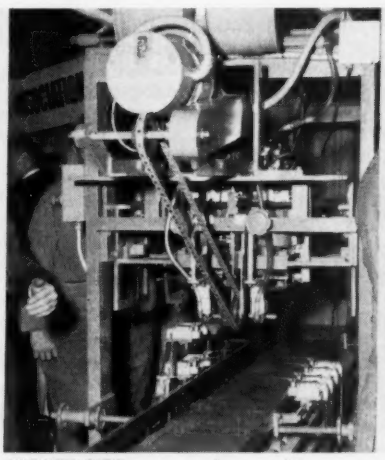


DOUBLE-TUBE machine forms-fills-seals 200 pouches/min. Simultaneously packages two different products in dissimilar materials. Features unique rocker arm-drive mechanism and simplified air-operated jaw assembly.—Hayssen Mfg. Co., Sheboygan, Wis. **(459)**

3 CARTON SEALERS



CASE SEALER features dialing system for setting up assortment of eight different glue patterns on flaps. Length of glue applications cam-controlled. Glue applicators pressurized and hermetically sealed.—ABC Packaging Machine Corp., Clearwater, Fla. **(460)**

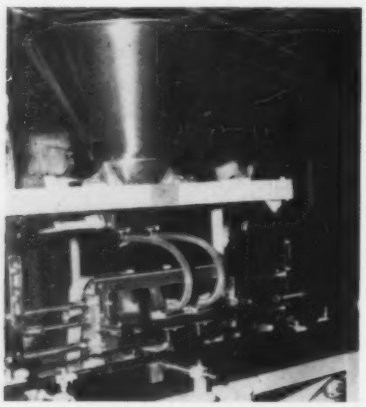


MIDGET-SIZE case sealer employs narrow strip of hot melt-adhesive to provide instant bond for holding flaps together, while wet adhesive applied on balance of flaps is setting. Eliminates compression section, saves floor space.—General Corrugated Machinery Corp., Palisades Park, N. J. **(461)**

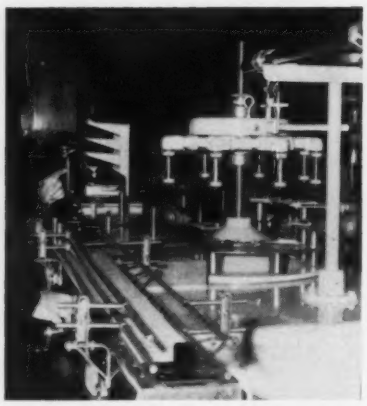
CARTON HANDLER sets up containers from flats, presents them for manual product loading and seals by applying hot-melt adhesive on one side and locking other. Speed up to 75/min.—FMC Corp., San Jose, Calif. **(462)**

For more information, circle key numbers on Reader Inquiry Card, back of book

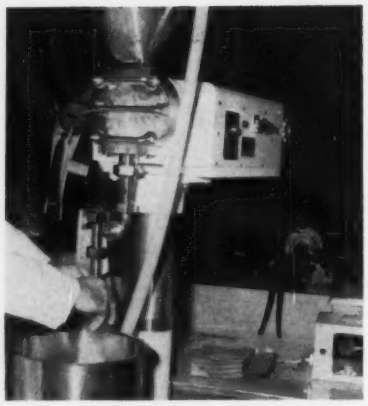
PMMI Show (Continued)



2 - CYLINDER, NON-STOP piston filler permits simultaneous moving of containers with filling heads during filling cycle. Heads automatically return to next two containers in line.—Elgin Mfg. Co., Elgin, Ill. **(463)**

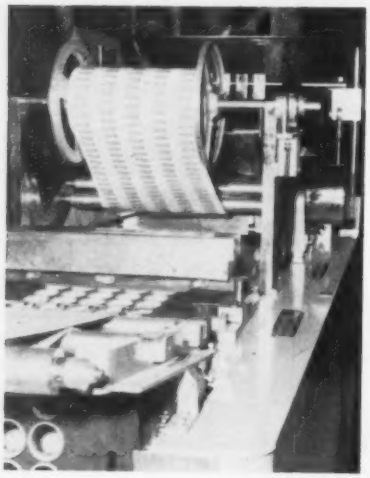


8-VALVE ROTARY filler fills viscous products like peanut butter at speeds up to 300 jars/min. Features vibrating 8-station fill-platforms and spring-loaded safety kick-out.—Karl Kiefer Machine Co., Cincinnati, O. **(464)**



BURSA-FILL unit electronically meters and automatically fills liquids, gravies and semi-solids into rigid and flexible containers within accuracy of 1½% at speeds up to 80/min. Unit employs impelling-metering action, with flow electronically controlled and dial-adjusted for various size containers.—Bursak Packaging Machinery Corp., Jackson, Wis. **(465)**

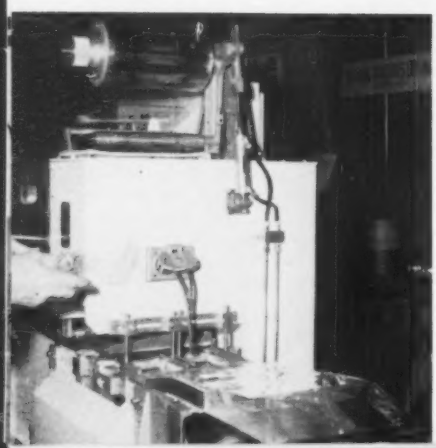
5 EFFICIENT FILLERS



◀ **UNIT CONTAINER** packaging machine fills and hermetically seals pre-formed aluminum foil containers (½-2 oz.) at speeds up to 240/min. Containers are heat-sealed with thin sheet of foil, separated into groups of 20 (under single cover), die-cut into individual containers that are deposited into pulp-board tray.—Ekco-Alcoa Containers, Inc., Wheeling, Ill. **(466)**

ACCURATE BAG FILLER handles 2 to 25-lb. bag sizes. Bags are suction-fed from magazine, air-opened and fed on traveling pockets. Moving past 3-stage filling-spout stations, bags are spanked, then proceed to scale for final filling to net weight.—Smico, Inc., Oklahoma City, Okla. **(467)** ▶

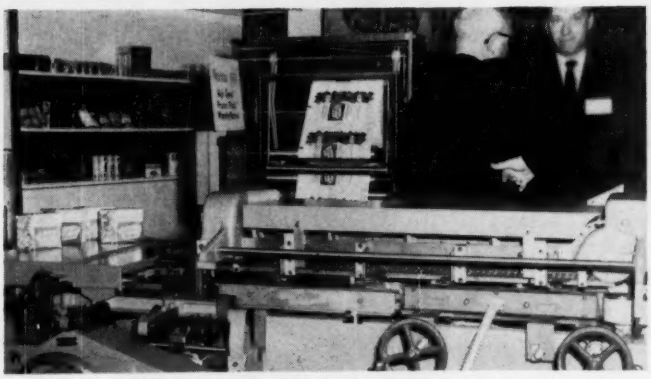
. . . . . 2 SPECIAL SEALERS . . . . .



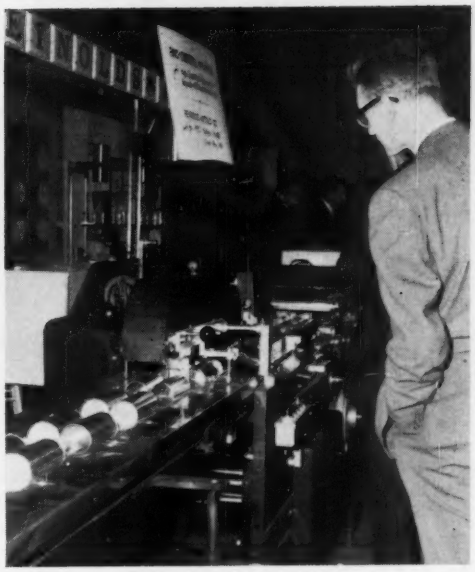
◀ **STRAIGHT - THROUGH** sealer handles pre - formed, pre-filled, thermo-formed polystyrene containers, applies heat-sealable, roll-fed mylar - polyethylene film-cover that's trimmed, slit and cut into individual blister packs. Speed: 30/min.—Packaging Industries Limited, Inc., Montclair, N. J. **(468)**

PNEUMATICALLY - OPERATED machine contour-wraps products in skin-tight film and seals before proceding through hot air-shrink tunnel. Speed up to 2,000 packages/hr.—Versapak Film & Packaging Machinery Corp., N.Y.C. **(469)** ▶

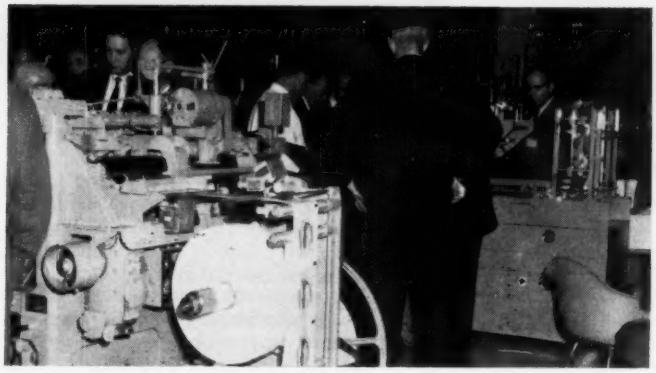
3 HIGH-SPEED WRAPPERS



SPEEDS UP TO 160 cartons/min. are attained on new frozen food overwrapping unit that's quickly adjusted for paper feed, elevator well, heater unit, and belt discharge.—Package Machinery Co., Springfield, Mass. **(470)**



WRAPPER'S converted for bundling four cans in heat-shrinkable film at speeds up to 100 cans/min. Film's fed from roll stock, cut, wrapped around assembled and conveyed cans. Bundled, wrapped product proceeds to cutter where individual packages are cut and ends sealed before continuing to hot-air shrink tunnel.—FMC Corp., Green Bay, Wis. **(471)**



◀ **COMBINATION** wrapper-cartoner is designed for wrapping candy or ice cream bars, which are collated and fed to cartoner. Latter (right) handles output from two wrapping machines, each wraps 150 bars/min.—Lynch Corp., Anderson, Ind. **(472)**

9 OTHER UNITS FOR BETTER PACKAGING

IN-MOTION CHECKWEIGHER classifies and sorts packages up to 5 lb. at speed of 120/min. Features take-away conveyor with straight-through and lateral discharges. —The Exact Weight Scale Co., Columbus, O. **(473)**

SMALL PACKAGE checkweigher has weight range of 2-50 oz., with zone-edge tolerance of 1/32 oz., operates at speeds up to 80/min. Housed zero meter assists in quick, accurate weight settings. Off-weights rejected by air-operated diverters.—Toledo Scale Co., Toledo, O. **(474)**

CONTINUOUS MOTION weight classifier provides high-speed, 5-way segregation of packages at speeds up to 300/min. Unit's convertible to 4-way or to either of two different 3-way patterns. Weight classification counters and total counter supply cumulative control data.—Illumitronic Systems Corp. **(475)**

AUTOMATIC filling-closing system for multi-wall bags operates at speeds up to 20 bags (100-lb.)/min. It combines bag feeder, filler-scale and newly designed closing machine. Latter forms gussets, levels top, and feeds bag to sewing machine.—Bemis Bro. Bag Co., St. Louis, Mo. **(477)**

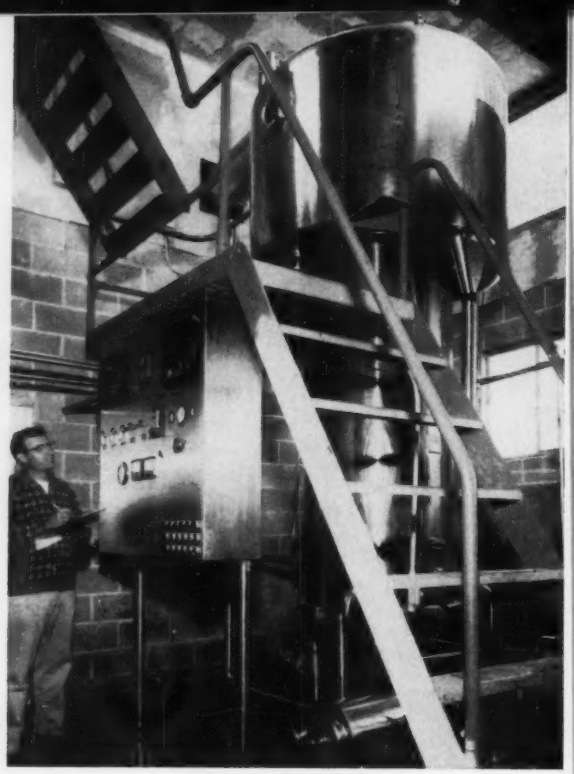
COMBINATION pouch packager-cartoner fabricates, fills, seals and cartons flexible pouches on one line. Pouch packaging speeds range up to 400/min., with up to 32 pouches inserted into wide variety of cartons.—Bartelt Engineering Co., Rockford, Ill. **(476)**

SEMI-AUTOMATIC machine applies and centers Cryovac sheets onto products packaged in foil containers with flared lip. Sealed containers continue through hot-air tunnel for controlled shrinking of film into skin-tight, transparent wrap.—The Cryovac Div., W. R. Grace & Co., Cambridge, Mass. **(478)**

SMALL WHEEL APPLICATOR applies hot-melt adhesives to intermittently-fed cartons, and seals.—National Starch & Chemical Corp., N.Y.C. **(479)**

CARTON SEALER applies a line of hot-melt adhesive from reel-fed stock to cartons, folds flaps and presses. —United Shoe Machinery, Cambridge, Mass. **(480)**

SEMI-AUTOMATIC cartoner combines top loading with intermittent motion. Speeds: 20-60 cpm.—R. A. Jones & Co., Inc., Cincinnati, O. **(481)**



NEW EVAPORATOR takes steam evaporated from Sonoma Valley Cheese Co.'s skim milk, efficiently re-uses it to concentrate more incoming skim.

'Boilerless' Evaporator Saves Btu's . . .

. . . by recovering heat in vapor removed from product being concentrated. Vapor is mechanically compressed and fed into evaporator's heating tubes

A LOT OF USABLE HEAT is wasted in vapors removed from products concentrated in evaporators. If this heat of vaporization is re-used—recycled through the evaporator—energy costs are considerably reduced.

This boilerless-waterless method of running an evaporator has recently been adopted by two dairies —Ryan Milk Co., Murray, Ky., and Sonoma Valley Cheese Co., Sonoma, Calif. Both have installed a new DR (dynamic recompression) evaporator, developed by Henszey Co., Inc., Watertown, Wis. Ryan is using it to condense skim milk and ice cream mixes, Sonoma for raw skim milk.

Compression Does It

Successful re-use of product steam would not have been achieved, except through a breakthrough in design of the evaporator. Operating principle is based on using a mechanical compression unit (Roots-Connersville) and new DR effect to concentrate products efficiently to high solids at low temperature differences (between product and heating medium).

Mechanically compressing steam into evaporators isn't new. Principle has been successfully employed with evaporators in other industries. But what is new, and different from conventional evaporators, is the source of steam, which is evaporated from products being concentrated. This steam is no longer wasted but compressed to higher temperatures and pressures, then introduced into DR evaporator's steam chest to become the heating medium. Temperature of compressed product steam is much lower than steam used in conventional boiler-evaporator combinations.

Basic operating differences. In a DR unit, product vapors are piped to a compressor (a rotary, positive-displacement gas pump). Compressed vapor is then piped to evaporator's steam chest to be used as evaporator's heating medium. Its heat of vaporization is transferred through evaporator's vertical tube walls to product. Serving this heat-transfer purpose, vapors are then immediately condensed—without need of cooling water—into a soft water that can be used for boiler make-up. System is equipped with an external recirculating pump. Part of the compressed vapor is withdrawn and part is re-used with new vapors from product being concentrated.

In effect, new unit is a self-contained boiler and condenser. Compressor takes the place of the boiler, cooling water well and pump.

A conventional evaporator's steam chest takes steam from an external source, the boiler. Steam evaporated from a product is then wastefully condensed. And this calls for a condenser along with cooling water—about a pound for every pound of vapor.

By way of comparison: A conventional evaporator might operate at 160F. (temperature at which product is boiled off by 210-F. steam), with steam constantly supplied from boiler. But a DR unit operating at 140F. re-uses product's vapor that is reheated by mechanically compressing it to a higher temperature—from 140F. and 24-in. vacuum to 157F and a 21-in. vacuum. Amount of compression varies with product handled.

Here's an idea of the savings

FE Staff

involved: Say your steam costs 90¢/1,000 lb. If you have a modern double-effect recompression evaporator, a DR unit could save you about $190/million lb. of skim milk evaporated.

Dairy installations. Ryan is using a 15-ft. high evaporator with a 6-ft. dia. dome and a 200-hp. compressor. It handles 10,000 lb. of raw skim milk and ice cream mix hourly. Skim is concentrated from 8.6% solids to the required concentration. Concentrate is either used as is or directed to a spray dryer. Mixes are concentrated from 9 to 36% and used in the manufacture of ice cream. Ryan used to employ a conventional steam evaporator.

Company cites these benefits: (1) overall fuel and electrical costs per pound of product produced reduced by about two-thirds, and (2) labor costs slashed a similar amount, despite a recent increase in labor rate.

Sonoma is using a 14-ft high evaporator with a 5-ft. dia. dome and a 75-hp. compressor. It is concentrating 5,000 lb. of raw skim milk hourly from 8.6 to 17.2% solids content. Concentrate proceeds to a roll dryer. Formerly, company passed its raw skim milk through dryer.

Sonoma lists these advantages: (1) a 50% increase in production capacity, (2) a $500 reduction in monthly operating costs, and (3) a 180 to 95-min. reduction in the time required to dry 900 lb. of skim milk from 10,000 lb. of raw product.

Handles Other Products

Henszey has successfully carried out pilot-test work with a variety of other food products, easily and economically concentrating them in a wide range of densities. **Wheys** have been run continuously for 24 hr. to a 60% solids. **Corn syrup** has been concentrated to 80%, **tomato paste** to 15% and **gelatin** to 80%. **Skim milk** runs easily to 45%, and company states it can be concentrated to higher solids. Unit has also operated successfully with **brewers yeast, whole milk** and **buttermilk.** Company plans carrying out research with **fruit juices** and other products.

Henszey offers three test units of varying capacities. One is portable with a 1000 lb./hr. evaporating rate. Second operates at a capacity of 500 lb./hr., designed for manufacturers who want to submit test products to company. Third is a 3,000 lb./hr. unit that can be leased on a 6-months' trial basis. (End)

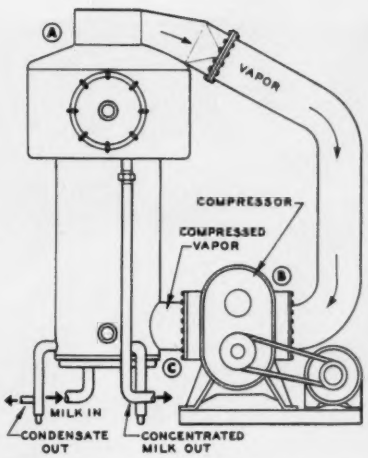
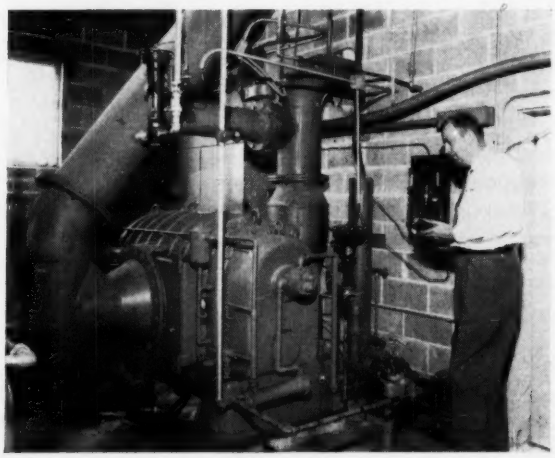


DIAGRAM shows how vapors are recovered, compressed for re-use as heating medium.



75-HP. UNIT compresses product's steam to higher temperature and pressure before feeding it to evaporator's steam chest and then heating tubes.

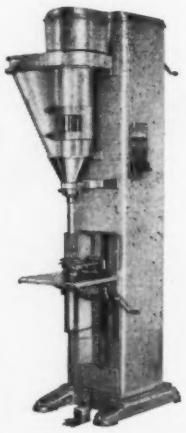
No area can be all things to *all* industries. But we've got down-to-earth facts that prove the Toledo-Northwestern Ohio area is right for Food Processing Industries. These facts are reported in a study of the area by Fantus Research, Inc., one of the nation's foremost industrial location services. If you would like to evaluate this information in terms of your plant location plans, write R. E. Johnson, Manager, Industrial Development Department, The Toledo Edison Company, Toledo 1, O.

THE TOLEDO EDISON COMPANY
an investor-owned electric light and power company serving Northwestern Ohio

Lederle looks to FMC Auger Fillers for critical accuracy in food packaging

Accuracy of fill becomes a vital consideration when the products being handled are valuable drugs such as aureomycin or complex food supplements such as Ledinac or Gevral Protein. Lederle Laboratories depends upon FMC Auger Fillers to maintain consistently accurate fill of these and many other products. In their plant at Pearl River, New York, Lederle uses six versatile FMC Auger Fillers for accurate packaging of a diversified line.

As with Lederle, many other manufacturers also have found that FMC Auger Fillers have the accuracy plus the versatility to successfully handle even the most varied product mix. • The semi-automatic EG-1 shown here can be equipped with four filling methods (cam volumetric, packing, gross weight and volumetric combined with vacuum) for both tight and loose fills. As a result, this one unit handles powders, granules and certain pastes in an almost limitless variety of containers. Changeover from one product or container to another is a matter of minutes, sometimes just seconds. So it's a perfect machine for short and medium production runs in large or small plants. • Many other FMC models—semi-automatic and automatic alike—are available to satisfy unusual requirements for accuracy of fill or type of packaging in both rigid and flexible containers at speeds up to 140 per minute.



FMC CORPORATION
PACKAGING MACHINERY DIVISION
Stokes & Smith Plant: 4914 Summerdale Avenue, Philadelphia 24, Pa.

For the full story on the FMC line of Auger Fillers, write for your copy of Bulletin P-811.

Topics for Communication

Employee communications can be only so much wasted effort if you don't know what to communicate. Before spending company money for house organs that serve only as gossip columns and birth announcement sheets, it might be worthwhile to take a communications audit in your plant to find out what is most important to both you and your employees.

Here are a few topics, as listed by the NAM, that you might consider: What competitors are doing; company's financial situation; significance of productivity; cost of doing business; the "break-even" point; possibilities and plans for technological improvement; production costs; burden of taxes; value of advertising; function of executives; prospective sales outlook; and the role of stockholders.

Decision by Committee?

According to a Stanford University professor, the old fire-and-smoke, fast-thinking, decision-a-minute type of business executive is a man of the past. "Leadership in the modern organization," he claims, "consists not so much in making decisions personally as it does in maintaining a decision-making system. The brilliant innovator is increasingly viewed as an organization hazard, rather than an asset in management."

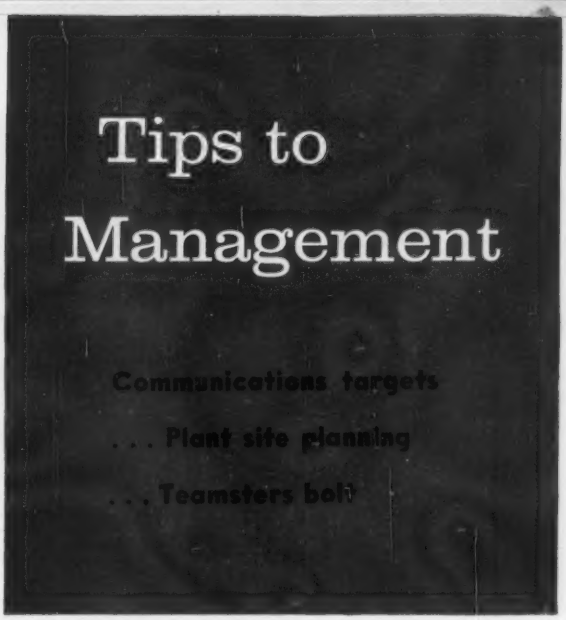
Dangers of this trend, he points out, are the development of management practices which, while safe and reliable, can yield at best only "a high level of mediocrity." What's more, he observes that the pattern commits us to a system that thrives on the ordinary and shuns the extraordinary in the interest of efficiency.

Teamster Local Votes 'OUT'

The Cincinnati Dairy Employees Union is now a charter member of the AFL-CIO after voting 1,664 to 12 to leave the Teamsters Union. Former Hoffa local made the move in an NLRB-controlled election after personal appeals and a series of legal moves by the Teamster chief had failed. According to Federation Pres. Meany, other Teamster locals in Ohio, specifically in Dayton and Columbus, are also planning to quit the transportation union.

At about the same time, Hoffa continued his efforts to organize production workers in an appeal to the General Executive Board of the Bakery & Confectionery Workers. He offered charters to the independent union's locals but added that the general affiliation must be OK'd at the BCW's next convention. After that, he'll accept charters from individual locals—a move that will probably be equaled by the AFL-CIO and result in raiding by both sides.

The BCW appears to have little harmony in its ranks, with factions favoring both Teamsters and Federation affiliation. Hoffa explained that the BCW would be taken in under a separate division—although it's likely Teamster Councils would run the show.



Picking a Plant Site

For most small firms, selection of a plant site is a once-in-a-lifetime occurrence. And, since they usually have neither experience nor company specialists, costly mistakes are often common in preliminary planning.

As an aid, the Small Business Administration lists these planning steps in a location survey:

► Study existing operations to determine what problems are involved and if a new plant is really the answer.

► Determine objectives sought in establishing a new plant.

► Prepare a list of requirements as to area, community and site.

► Decide upon specific methods to be used in investigating and selecting area, community and site.

► Set up whatever organization is needed to carry out the project.

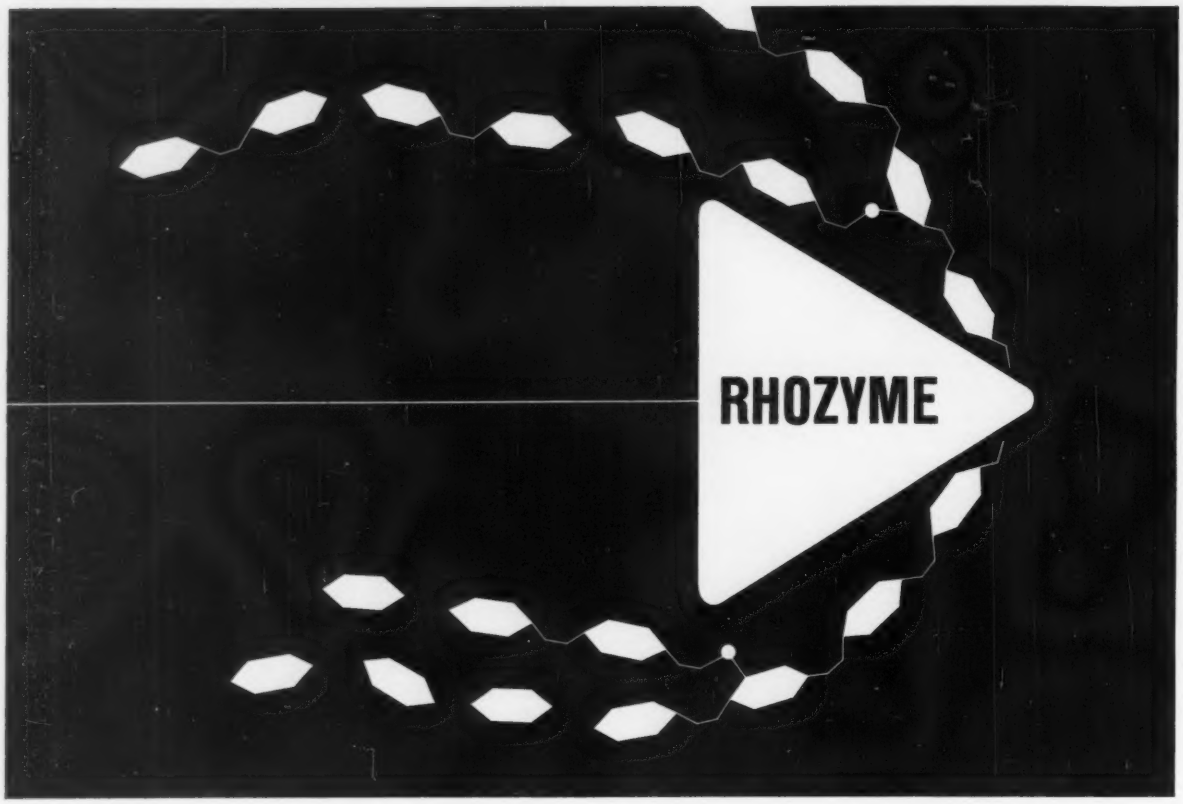
► Check available sources of information such as railroads, public utility companies, state development agencies, chambers of commerce, etc.

BRIEFS

FYI—Two more state AFL-CIO organizations, Oregon and Tennessee, are setting up "special funds for political and legislative education and activity." Others are already under way in Alabama, Louisiana, and Mississippi.

Interpretive bulletin on agricultural exemptions provided under the amended Fair Labor Standard Act—the Federal Wage-Hour Law—has been issued. It's available from USDL's Wage & Hour & Public Contracts Div. in principal cities or by purchase in quantity from Government Printing Office, Washington 25.

Company costs for employee medical services increased by more than 10% over past five years, according to a new survey by the NICB.



Breaks up starch chains into more useful segments

Rohm & Haas offers a variety of RHOZYME® diastatic enzymes which can give you the saccharifying or liquefying action you need in processing starches.

Certain grades of RHOZYME convert starch chains to simple sugars—for applications requiring either sweetening or the presence of fermentable or reducing sugars. Other grades break up starch mostly into dextrins with minimal increase in reducing groups, to provide controlled degrees of liquefaction. Rigid starch gels can be given viscosity levels ranging from thick slurries to free-flowing liquids.

Applications of RHOZYME diastatic enzymes include: breadmaking; pharmaceutical uses; processing of chocolate sirups, pre-cooked cereals; production of acid-enzyme converted sirups, high maltose sirups, high glucose sirups; liquefaction and saccharification of grain, corn, or potato starch for the distillation industry; starch modification for paper coatings, laundry starches, adhesives, textiles; recovery of sugar from candy scrap; starch waste disposal.

Write Dept. SP-23 for technical literature and samples of RHOZYME enzymes.

ROHM & HAAS

PHILADELPHIA 5, PA.

RHOZYME

CHART 1

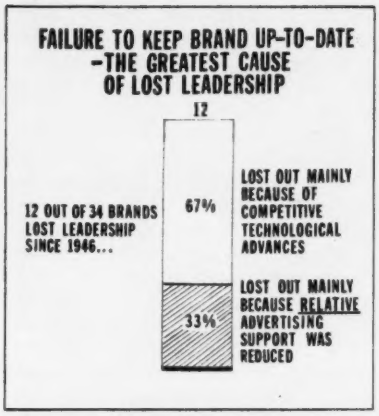
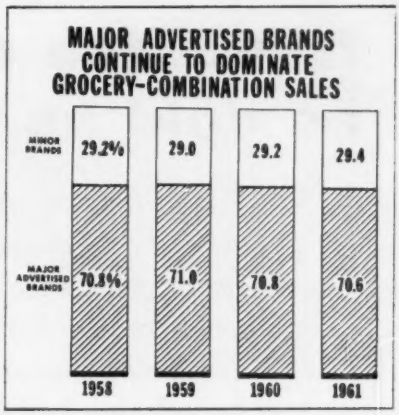


CHART 2

CHART 3



PROFITS IN NEW PRODUCTS are graphically illustrated by Nielsen studies reported to GMA members. CHART 1, based on a progress study of 34 food product classifications over a 15-yr. period, noted that eight of twelve brands that lost leadership were challenged by new or radically improved competitive brands having a definite consumer advantage. CHART 2 illustrates that new brands increase rather than replace total business by pointing out that 12 new brand and 32 old brand product groups increased in sales over a 4-yr. period, although successful new brands had twice as much sales gain. CHART 3 shows little change in consumer preference for advertised brands—still 71% of sales.

Food Execs Face Facts —Then Plan Ahead

Top industry executives at GMA sessions hear and discuss the past, present and future. Need for better image stressed by all

THE INDUSTRY IMAGE, new products and packages, and the opportunities for foreign expansion highlighted the 53rd Annual Meeting of the Grocery Manufacturers of America in New York City.

Paul Willis, GMA president, spelled out the rapid growth of the food industry and pointed to an estimated '61 figure of $78 billion for food consumption compared with $16 billion only two decades ago. Over this same period, Mr. Willis noted the growth of grocery items from 1,000 to 8,000, two-thirds of which were either new or materially improved products introduced during the last 10 years.

He also emphasized the ability of today's housewife to prepare three meals a day in 1½ hr. compared with an earlier time requirement of 5½ hr. Aside from this growth in convenience, he reported that today's food products in many instances are far superior in nutrition, tastiness, safety, variety, and quality.

Despite this record, many industry leaders exhibited an increasing concern over the consumers' doubts about the industry's honesty and sincerity. Wide-spread publicity given to certain short-weight packages, the leaders stated, has given the consumer an unfair and incorrect image of this country's largest business. To eliminate this image and minimize future Federal investigations, GMA members called for careful scrutiny of each company's packaging and production operations. Also under considerable practical discussion was the need for the industry to tell its side of the story to the consumer via a concerted effort on the part of GMA and the industry in general.

On the positive side, John A. McGlinn, Jr., Campbell Soup Co.'s marketing v.p., reported that food advertising this year will amount to about $950 million. And Mr. Willis, in referring to the industry's product growth in many areas, stated that it had been done at prices which are no higher today than '52—despite the fact that the overall cost-of-living index rose 12% during this period.

New Product Growth

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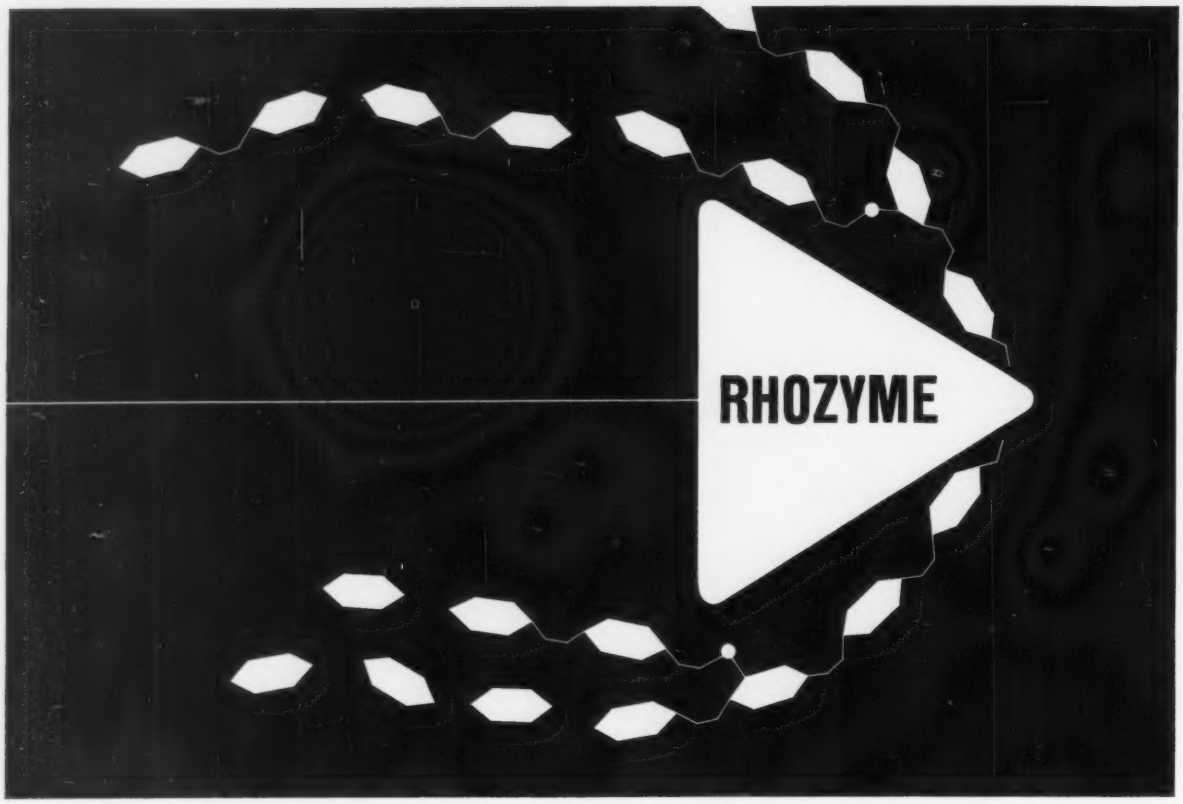
He described his firm's most recent surveys that indicate the value of successful new products. Based on the composite trend of nine convenience products, firm's survey noted a 2-year sales increase of 55% between '59 and '61. Another analysis, based on a composite trend of 18 new and/or improved brands marketed nationally in '58 or before, showed consumer purchases of these brands up 51% since '59. Fifteen of these brands were entirely new; the

FE Staff



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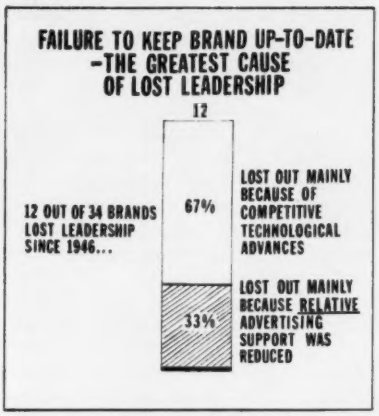
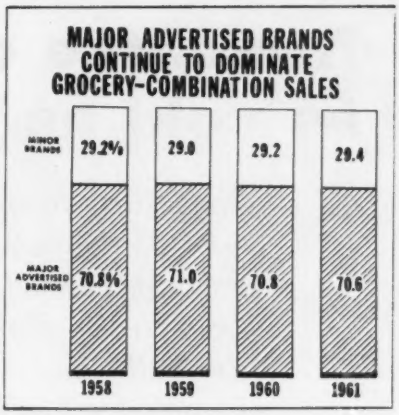


CHART 2

CHART 3



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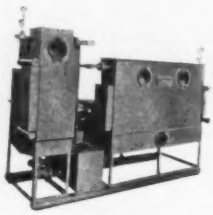

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other three represented improvement of established brands. And many new convenience items have actually replaced former leaders in their product category (See chart).

Where to aim your strongest distribution guns was also discussed via a Nielsen study of retail outlets. Based on the '58 Census of Retail Distribution, estimates for '60 showed that chains and superindependents — some 11.8% of total stores or about 37,000 outlets—account for almost 71% of the business. Despite the strength of this relatively small group, the Nielsen representative reported finding considerable evidence that these key outlets are not receiving a proportionate share of the selling effort.

A pilot survey of discount stores estimated grocery sales at about 742 million or about 1.5% of total food store sales. Of some 6.6 million sq. ft. of discount store floor space, survey found about 380,000 sq. ft. devoted to food products. Significantly, much of this volume was found to be in leased operations run by traditional food store operators.

Foreign Markets

On the international level, Carl Shaver, president of International Supermarkets Corp., cited the rapid growth of the European economy, population and buying power. The Common Market, European Free Trade Assn., and future CM member Spain, he said, comprise a market of 290 million people which spends 36% of its consumer dollar for food, 12% more than in the United States.

Significantly, Mr. Shaver pointed to the present dominance of a relatively few food companies in Europe. In light of the increased population and income, he sees more and more European food manufacturers becoming aware of the vast food business potential. He similarly cited the opportunities in Western Europe for American food companies, either through export or by establishing operations on the Continent.

Mr. Shaver stressed the improvements in refrigeration and packaging which are very much a part of overall European development. While he does not see an immediate large market for frozen foods since the number of home freezers is still small, he emphasizes that the market potential is growing rapidly. (End)

CIRCLE 52 ON INQUIRY CARD

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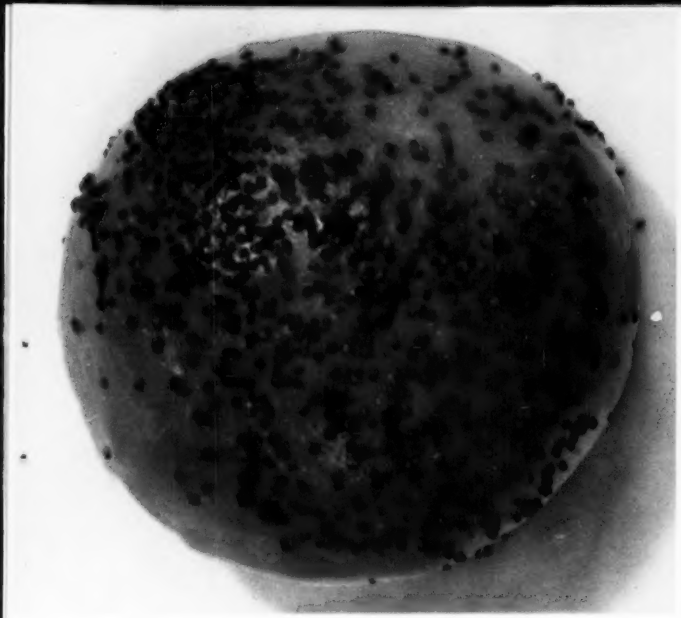

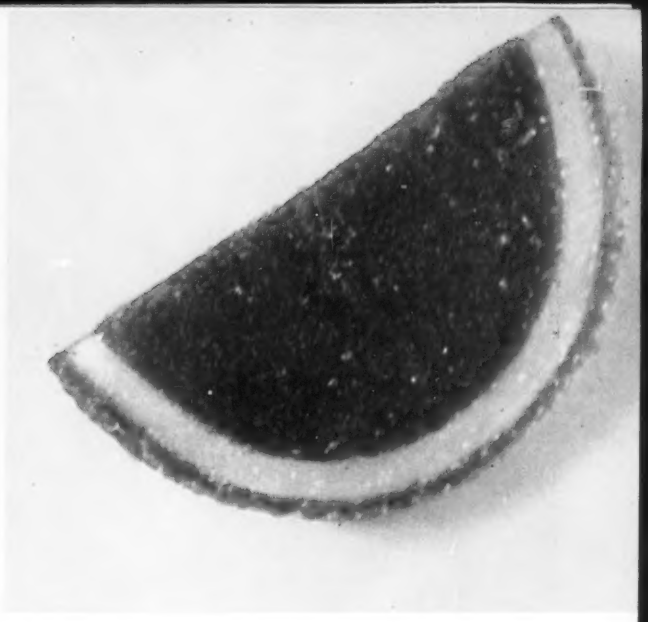

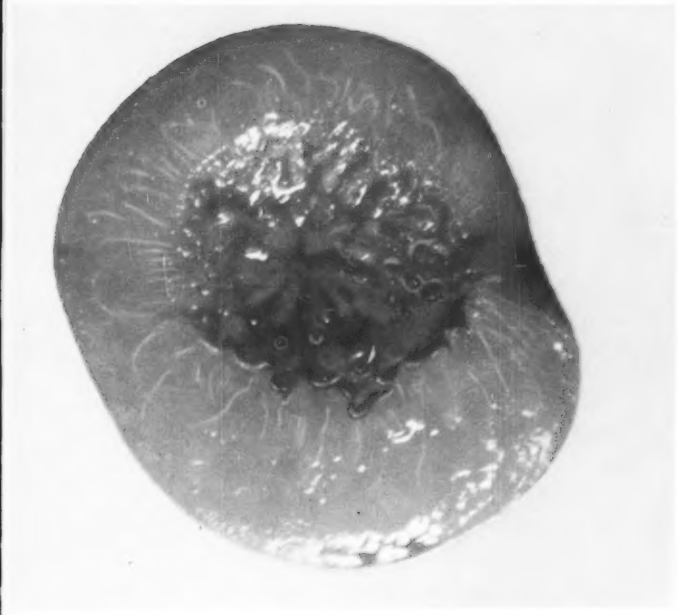

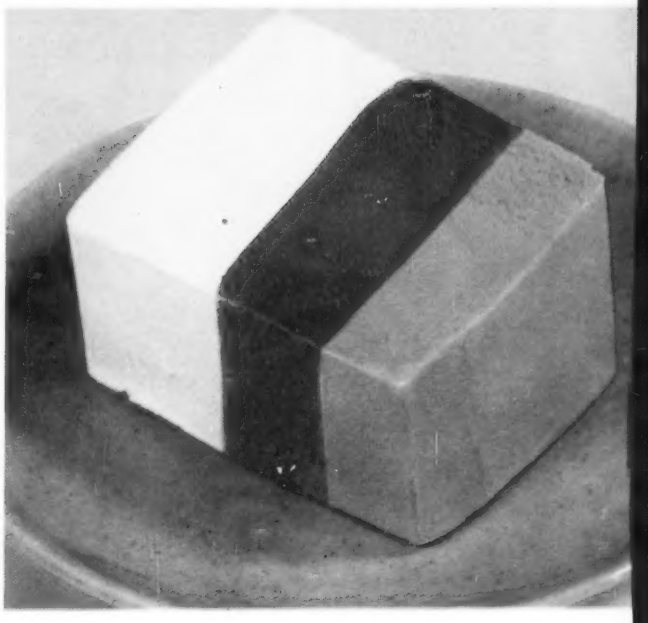

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CIRCLE 54 ON INQUIRY CARD

CIRCLE 55 ON INQUIRY CARD →

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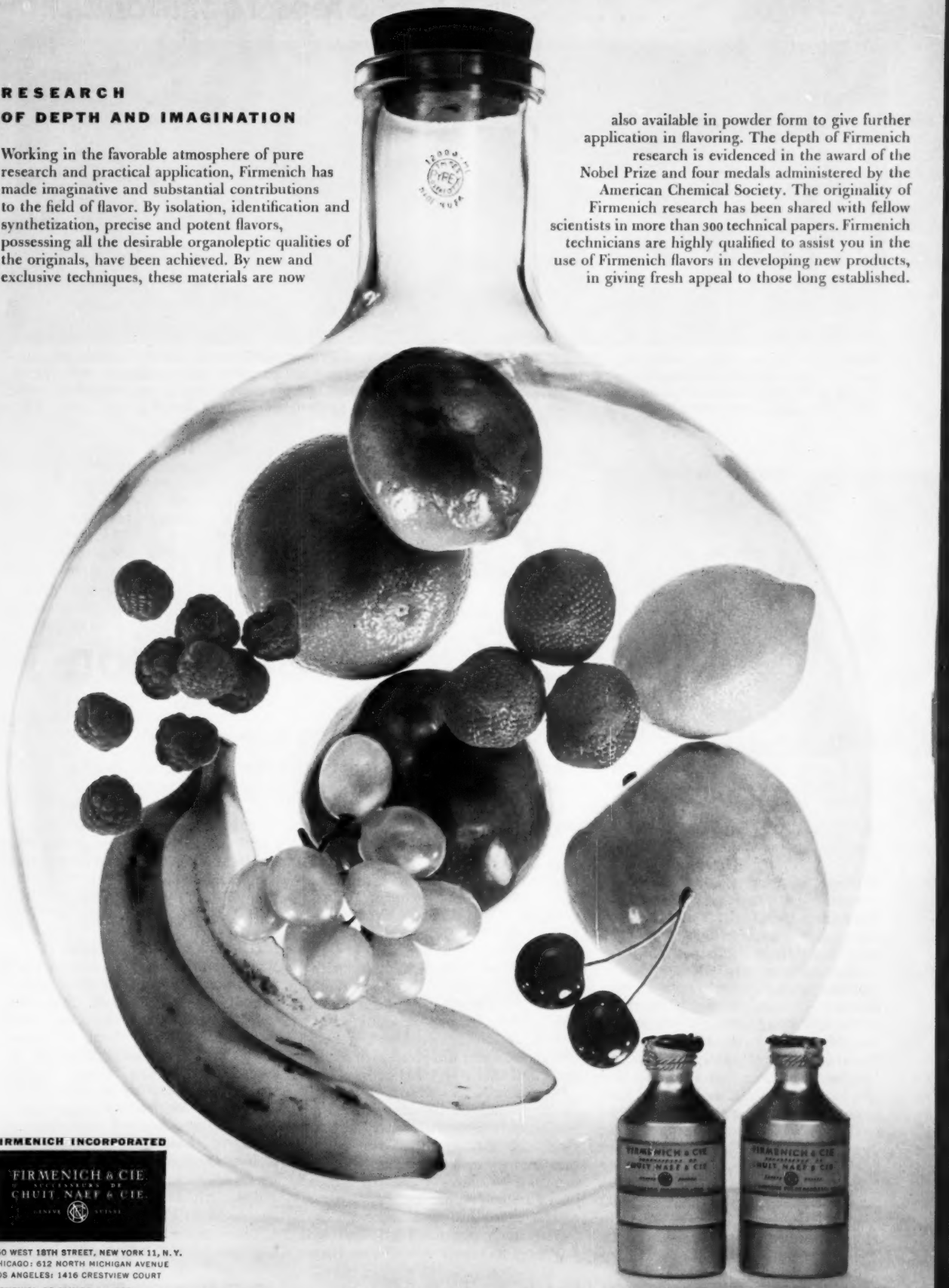

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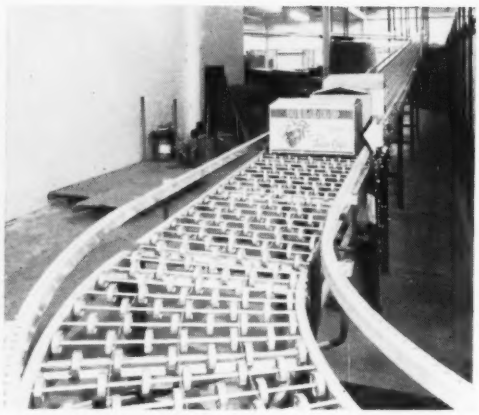
BAGGED CHIPS are loaded into shipping cases and those carton-packaged are tray-packed, then machine-tied (A). Cases are conveyed to turntable (B) that reverses their movement while feeding inclined conveyor (C) leaving packaging room. . . .



. . . **TRANSFERRED** to gravity-wheel conveyor, cases travel to pallet racks in storage area. Small power-belt section (arrow) slows and spaces cases to prevent jam-ups and crushing. . . .

Automatic Case Handling Simplifies Order Selection

Mechanized order-picking system facilitates moving fragile products through warehouse and eases handling a variety of items

IS YOUR CASE HANDLING complicated by a variety of fragile items and of package sizes? Maybe, too, cramped quarters necessitate costly, fatiguing movement of cased goods in and out of storage by hand and then transporting to shipping?

The answer to your problem may be a conveyorized system of feeding cases to "live" storage units and discharging from them to shipping. Such a system is working very efficiently at Hiland Potato Chip Co., Des Moines, Ia. It's handling 10,922 cases of chips per week. (Cases hold 6 to 96 packages of chips, ranging from 5/8-oz. bag to 3-lb. institutional pack.)

System can be easily adapted to changing package sizes. It requires only four operators—two to palletize cases and feed them to live storage (Rapids-Standard Flow Racks) and two for order-picking. Live storage area comprises four pallet racks (Flow Racks), each having four 82-ft. pallet lines supplemented with empty pallet-return lines. Each pallet line handles 20 pallet loads (25 to 50 cases per pallet).

Hiland has a variety of potato chips put up in different size packages and cases—a total of 18 types of cased products which, in its old facility, had to be identified for handling in a tangled plant layout. Company was cramped for quarters in its old 3-story facility, often had to move cases 16 times on and off dollies, conveyors, chutes and storage.

The company fixed all that by building a roomy plant and then "going automatic." This means replacing the old system with the mechanized one installed by Rapids-Standard.

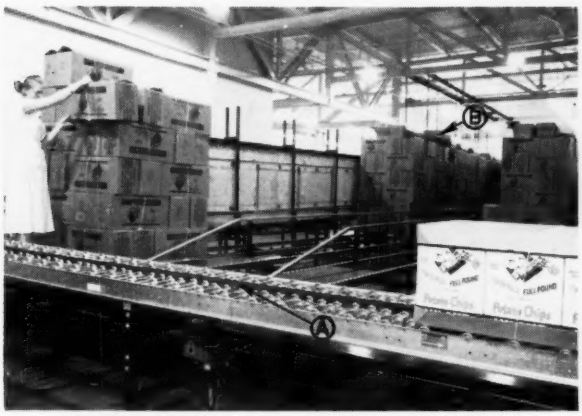
Old Way of Handling

Hiland's plant manager, N. C. Rasmussen, says: "The hard fact was that our handling costs were completely out of order. Handling involved taking cases from tying machines, setting them on hand trucks that were transferred to congested storage area. There they were stacked on the floor, later to be skidded to spiral chutes feeding them to first floor for restacking. Order pickers again had to load them onto hand trucks and wheel them to delivery trucks and semis. All in all, it took seven people to do the job."

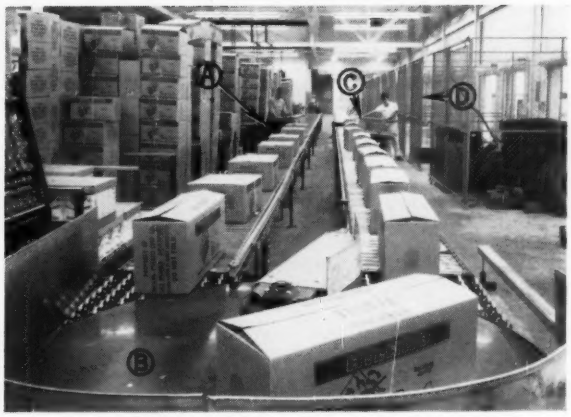
Efficient materials handling was a major design consideration at

JOHN V. ZIEMBA, Senior Associate Editor, "Food Engineering," Chicago

Handling of Cased Chips . . . . . .



. . . **MOVING ALONG** adjustable-pressure conveyor (A), easy-to-damage cases are gently accumulated as girl removes them for pallet stacking and subsequent travel through Flow Racks (B). . . .



. . . **AT DISCHARGE END** of Flow Racks (A), orders are selected, fed onto live-roller conveyor for turntable (B) to reverse flow so that transversing diverter (C) guides them off conveyor. Worker then transfers orders into pre-selected salesmen's cages (D). . . .

the new million dollar plant. Even in initial planning stages, Hiland studied all phases of operation from a materials handling standpoint. The result is a sound, low-cost, thoroughly integrated handling system.

With it, here are nine big gains the company counts:

. . . **It requires fewer men.** Four men now handle more work in less time than seven could under the old system.

. . . **It practically eliminates crushing and damage to products and shipping cases.** Rasmussen says there's not been a customer complaint on breakage of extremely fragile potato chips since new system was installed.

. . . **It provides first-in first-out movement.** This is important since company doesn't permit chips to remain in storage over 24 hr. And the Flow Racks assure automatic stock rotation—what goes into them first, must come out first.

. . . **It increases storage capacity.** The racks use a maximum amount of available space through better utilization of the "storage cube." It also eliminates wasted aisle space.

. . . **It speeds order selection.** Racks reduce non-productive searching in order-selecting operations, since all cased goods are positioned in a convenient short-selection "front." Men don't have to wander through "dead storage" areas, circulate around stacks of palletized chips.

. . . **It offers automatic control of inventory.** Racks provide visual control of stored chips, stacked in pre-selected pallet lines for fast, accurate location.

. . . **It eliminates shipping errors.** There's no longer the confusion and congestion so common with the old system when hand trucks cluttered packaging and warehousing areas.

. . . **It improves housekeeping.** By providing a spot for each item, Flow Racks abolish congested areas and make them neater. At the same time, working conditions are safer.

. . . **It reduces use of air conditioning units in packaging area by one-third.** That's because there are no longer any hand trucks that require frequent opening and closing of doors.

Here's what Rasmussen has to say about the new system: "Although it has been operating for several months, it has revolutionized our handling methods. We immediately experienced a reduction in warehousing costs. And breakage, so critical in our business, has been virtually eliminated. Despite the fact that we had grave doubts the system could be adapted to fit our handling, stocking and order-selecting needs, we've noted that general efficiency has been greatly improved. However, we've not had time to figure out our actual cost savings. But we're sure they'll be impressive."

How New System Works

All case handling centers on the four pallet racks, each with four 82-ft. pallet lines. Case- and tray-packed chips are conveyed to Flow Racks from packaging and from them to shipping.

. . . **AFTER CASES** are removed from pallets, empty pallets are returned in upright position by inclined gravity-return line (arrow).

Movement's in this manner: Bagged chips are packed in collapsible, re-usable shipping cases and carton-packed chips are tray-packed at packaging stations. Both type packs are machine-tied with a single strand, transferred onto a power belt feeding, in sequence, a live roller conveyor and 6-ft. dia. turntable. Cases make a 90-degree turn as they're diverted onto an inclined belt conveyor that carries them through a wall opening—near ceiling on packaging room wall. They then reach maximum height (12½ ft. above warehouse floor), where they make a 120-ft. descent on a 2-ft. wide gravity-wheel conveyor (with two 90-degree-angle turns) that transfers them

onto an adjustable-pressure conveyor. Safeguards have been built into the gravity conveyor to prevent jam-ups and damage to cases. They comprise 2½- and 5-ft. case-spacing rubber-belt conveyors (20 in. wide) just ahead of each right-angle turn.

The adjustable-pressure conveyor (APC) is another safeguard installation. It's a powered belt conveyor that accumulates cases under power, with no buildup of forward-line pressure. And it conveys cases over long distances (here 80 ft.) without gravity and power booster combinations.

APC consists (along its 2-ft. width) of a 4-in. wide power belt and four special types of wheels—load-carrying, "trigger," pressure, and guide (end idlers). **Specifically:** Belt has a V-section molded to bottom to guide between pressure and end-idler wheels. **Load-carrying wheels** (skate rollers mounted on conveyor) support most of case weight. **Pressure wheels** bring belt in contact with bottom of cases. **Trigger wheels** release pressure wheels lowering belt from contact with case. And **guide wheels** help keep belt tracking properly.

These design features reduce belt friction, require less power to drive conveyor and minimize maintenance problems. Moreover, they eliminate belt-tracking difficulties, while insuring smooth, gentle acceleration of cases from an accumulation stop. Most important, crushing, jack-knifing or pile-up of cases are abolished. It takes only fingertip pressure to stop an entire line, while belt continues to run.

From APC, two girls stack cases onto plywood pallets (maximum height, 7 ft.) at feed end of any of the 16 pre-selected pallet lines. Built into APC is a remotely operated system for controlling the conveyor—to start, reverse and stop it. This way, the girls can easily control the spot along the conveyor to which cases are to flow, without manually carrying (in some instances) the cases to a pre-selected pallet line area—once they've passed it.

System comprises three colored cords (blue for forward motion, brown for reverse, and yellow for stopping conveyor) alongside the conveyor. By simply pulling one of the cords, girls have complete control over conveyor's operation. Each cord is attached to the eyelet of a spring-actuated metal rod with pushbutton contactor.

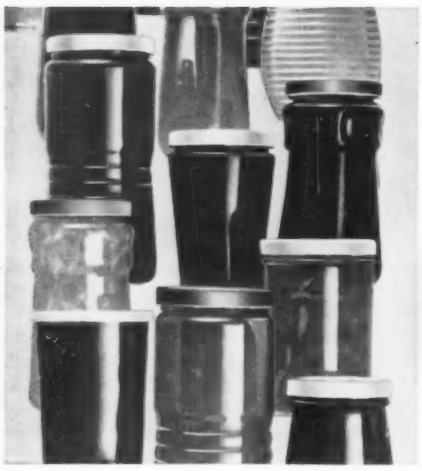
Palletized cases travel through Flow Racks along a chain belt equipped with "dogs" that eases them down a 16-in. incline in each gravity-type pallet line. Each line holds 25 pallet loads, or a total of 400 pallets. At discharge end of each line, first-in pallet loads become first-out. And cases are easily selected by two order-pickers.

Pickers place cases on a live-roller conveyor that travels the length of the order-selecting area. As orders flow toward the truck-loading area, a gate from another conveyor discharges items distributed (but not manufactured) by Hiland to merge with orders. A second turntable reverses direction (makes 180-degree turn) of orders as a track-mounted transversing conveyor "reaches" out across the final live-roller conveyor to direct orders into individual cages for pick up by route-truck salesmen. Each salesman has his own key-locked cage.

Orders going out of Des Moines are diverted onto an extendible conveyor that telescopes into semis and moves laterally from one warehouse door to another.

(End)

NUTRL-JEL



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SPEAS APPLE PECTINS

TRY SPEAS APPLE PECTIN AND PROVE TO YOURSELF THE AMAZING RESULTS THAT COME FROM APPLE PECTIN

- Adaptable to wide PH range.
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Better Product Consistency and Quality for Over 40 Years

Write, wire or phone for information, technical advice, or location of nearest warehouse.

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FROM EARLY FOIL TRAY with crimped foil, seal and paste-on label (left), Stouffer packages switched to a side-tapered foil container with foil-lined cardboard lid and overwrap (center), and then to present foil tray with polyethylene-lined paperboard plug-lid crimped to tray and packed into end-lock carton (right). Present designs initiated use of pictorials.

Stouffer Designs an Image

Today's changing design trends require organized packaging development. Here's how Stouffer's committee team concept builds a family look for its fast-growing line of frozen foods

ORGANIZATION is the key to effective operation in any phase of business. If you're a food processor faced with an intense competitive market, **packaging organization** can be the key to sales success.

At the Stouffer Corp., packaging is an integral part of the total operation and is considered the most important selling mechanism for the company's line of some 30 frozen food products. As a result, organization and basic fundamentals are keyed to a changing market with much better than average success for Stouffer products.

This famous restaurant firm didn't get into the frozen food business until '54. Knowing little about industry packaging and merchandising, Stouffer simply packaged its frozen food servings in the rear of restaurants for guests to take home. From there, firm's products moved to restaurant freezer cabinets and then to retail and grocery outlets where competition was big.

As the product line grew, distribution programs and company size expanded rapidly. And, from the first frozen Stouffer item packaged in simple waxed cartons, the company and its products have advanced to the point where the red Stouffer color is well-known to shoppers throughout the country —and its share of freezer cabinet space is still growing.

How did they do it? One big answer was the development of an effective packaging committee, guided by modern fundamentals (See panel), that carried the Stouffer package through various stages of evolution to an effective competitive position.

Committee's overall functions, as described by marketing director **James M. Biggar**, are to:

... **Administrate** package development work.

... **Clearly define** areas of packaging responsibility.

... **Develop standards** for packaging materials and artwork.

... **Spread packaging know-how** among more of its people.

... **Gear packaging to spark** impulse sales at retail level.

... **Serve as a forum** to exchange ideas on packaging.

... **Produce more effective,** less costly packages through a package-planning program that is organized and executed with skill.

Member Functions

In effect, the committee serves as a group whose main objective is to research, develop, and design packages for the production department. Members and their integrated functions include:

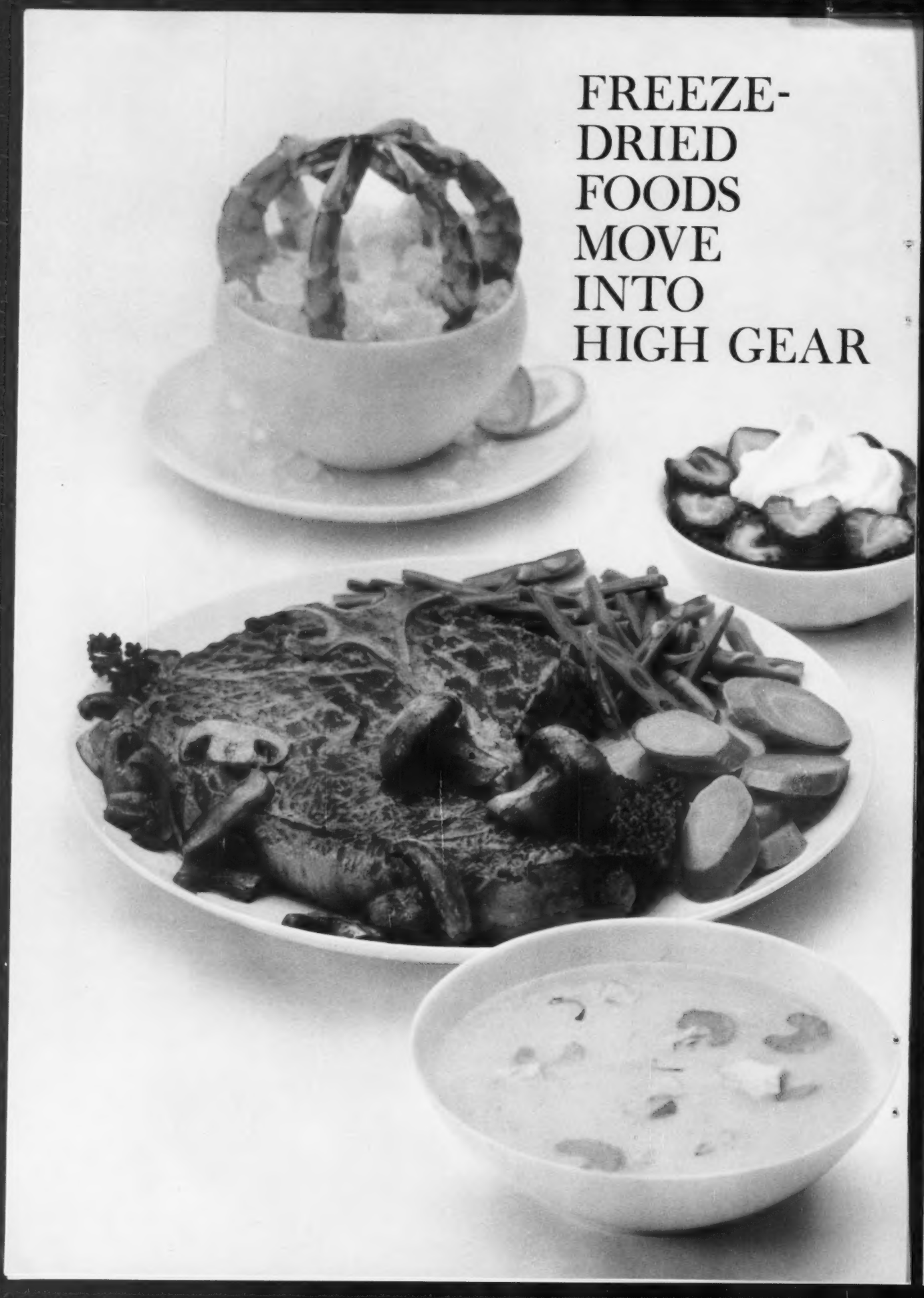
► **Director of marketing.** He sets up packaging policies and strategies to match packaging to merchandising and distribution techniques. It's also his responsibility to carry out value-analyses to make sure the company is receiv-

(Turn to page 62)

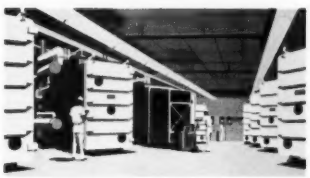
FE Staff

CIRCLE 61 ON INQUIRY CARD →

FREEZE-DRIED FOODS MOVE INTO HIGH GEAR



. . . *with* STOKES *proven production equipment*



The phenomenal increase in freeze-dried food production in recent months has surpassed all expectations. And it's no wonder! The excellence of freeze-dried foods in color, taste and nutritional value has won the overwhelming praise and acceptance of both consumer and food processor alike.

To help make freeze-dried foods *a marketing reality for your company*, Stokes offers a complete line of *proven* freeze-drying production equipment. Pioneer in the development of freeze-drying techniques for more than 25 years, Stokes has amassed unparalleled experience in the design, manufacture and application of freeze-drying equipment. Today, Stokes is the leading supplier of freeze-drying research and production equipment.

An investment in Stokes freeze-drying production equipment—whether it's a packaged unit, a system, or an entire plant—brings the assurance of complete, tested performance in the freeze-drying of a wide variety of meats, fish, poultry, fruits and other foods. Stokes will supply standard or special equipment to suit your particular pilot plant or production requirements . . . will install it . . . will train your personnel.

Get a head start on freeze-dried food production by contacting your nearest Stokes representative. Be sure to write for descriptive brochure which outlines the many advantages of putting Stokes' freeze-drying experience to work for you. Food Processing Equipment Division, F. J. Stokes Corporation, 5500 Tabor Road, Philadelphia 20, Pa.

You are invited to use the facilities of the Stokes Freeze-Drying Laboratory to obtain expert evaluation of your particular food products or processes. We will prepare small quantities of your food products for testing and evaluating.

STOKES

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Stouffer's Packaging Fundamentals

A series of fundamentals basic to Stouffer packaging has been developed by the firm's packaging committee. As outlined by marketing chief J. M. Biggar, they include these requirements:

Display products as a complete line and not as individual items.

Present packages to customers with a distinctive appearance—a quality package for a quality product.

Design packages suitable for horizontal or vertical mass display in freezer cabinets.

Use pictorials that are different, tasteful and suggestive of highest quality.

Standardize size for neat and efficient merchandising.

Identify products on all six sides of packages for easy recognition in store and home.

Maintain a rigid control on package and product quality via continuous checks of incoming and outgoing packages.

Provide simple and easy-to-read-and-follow preparation directions.

Maintain pilfer-proof package concept created by side-locking cartons with a tight bind.

Tightly control cost of packages so that any savings can be channeled into high quality product ingredients.

Reviewing these overall fundamentals whenever packages are redesigned.

ing adequate value for the cost of its packages. Example: While other frozen vegetables, fruits, etc., are displayed throughout the display case, all Stouffer packages are displayed in one section. Consequently, the red color theme for all Stouffer packages was developed.

► **Advertising manager.** He handles artwork and layout of package style, size of print, color, etc. He makes sure that layout lends itself to tie-in and cooperative ads and keeps a sharp eye on consumer trends such as boil-in-bags, rigid plastic containers, cartons with or without overwraps, etc.

In addition, he coordinates layout work with package suppliers, and develops promotional material and point-of-sales tie-ins. Example: Stouffer employs case dividers which hold case space for Stouffer products, thereby attracting customers and keeping other competitive products out.

► **Manager of quality control and product development.** He checks packages for proper direction information, product description, weight declaration, ingredient listing, number of servings, etc. This member also examines incoming packaging materials to make certain that colors, pictures, and trademark match standards. Color charts are used to distinguish light or dark packages.

► **Chief purchasing agent.** This member purchases new packaging materials, and equipment; negotiates material costs with suppliers; presents cost comparisons such as waxed vs. varnished finishes; follows through on handling of new packages on existing, modified, or new equipment; and figures cost of optimum package-size combinations. Duties also include funneling information between the committee and suppliers.

Throughout the meetings, minutes are kept by the committee's secretary (Chief purchasing agent) that later help the group work within certain standards. Copies are submitted to suppliers and become part of the purchasing specifications.

Advise and Consent

Acting as the central team, this four-member committee also works with a number of other company personnel during certain situations.

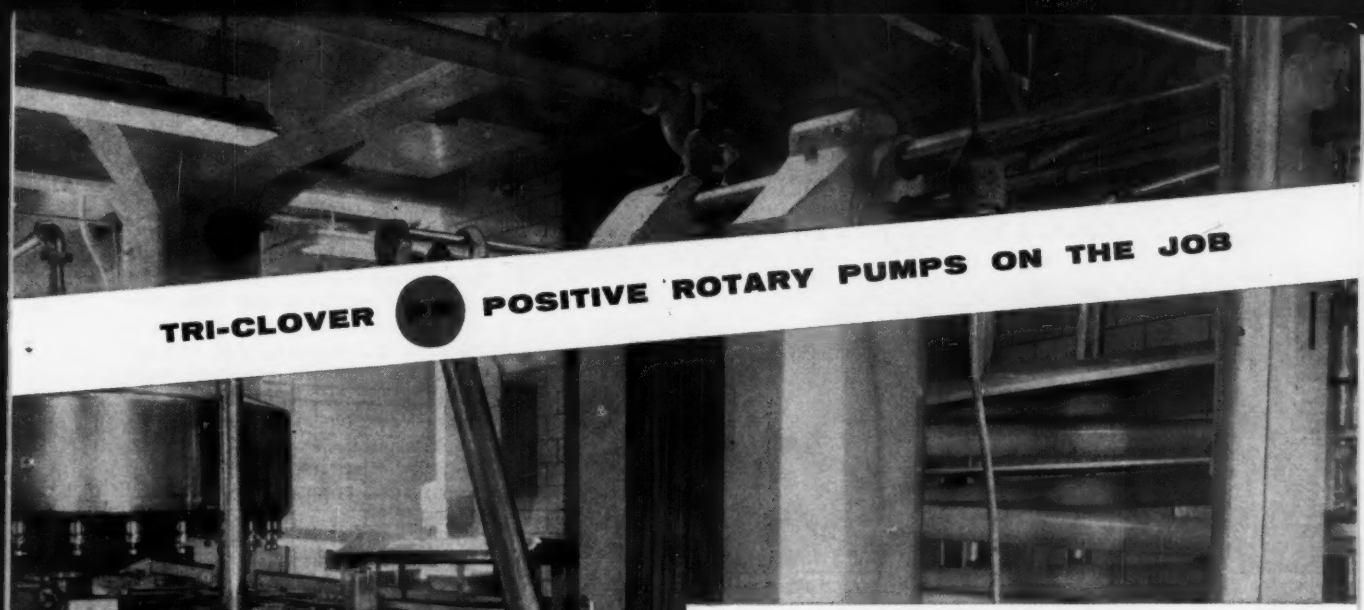
Product managers are called in when their particular product is under discussion and are also expected to keep the committee informed of package and product trends in their areas. The production manager is contacted to make sure that a newly developed package won't increase labor costs and will handle well on existing machines at required speeds. The industrial engineer is involved whenever changes in machines become necessary. For example, if switching from a side to end-locking carton, he informs the committee whether it can be done on an existing machine with modifications or whether new equipment is necessary.

Working in this manner, the Stouffer package switched from its first wax-coated carton to a rectangular foil tray with a crimped foil seal containing a pasted-label. Next package to evolve was a side-tapered foil container with a foil-lined cardboard lid and a color-printed waxed paper overwrap.

(Turn to page 64)

PACKAGING COMMITTEE reviews Stouffer line for possible design improvements. Members are (l-r): Joseph Dwyer, purchasing director; James Biggar, director of marketing; Frances Pederson, manager of research & development; and Clark Munger, advertising manager.

CIRCLE 63 ON INQUIRY CARD →



TRI-CLOVER POSITIVE ROTARY PUMPS ON THE JOB

. . . serving Borden Company plant at Mount Vernon, N.Y.

The Borden operation in Mount Vernon, New York, is typical of the ever increasing number of progressive dairy plants that are installing Tri-Clover Division's new "PR" Series Positive Rotary Pumps.

Here are some of the reasons for the popularity of this new Tri-Clover high efficiency series: *FLOATING IMPELLER DESIGN; STATIC SANITARY O-RING SEAL . . . FULLY ACCESSIBLE; BEARING AND GEARS LOCATED IN SEPARATE COMPARTMENTS FOR MORE EFFECTIVE LUBRICATION* . . . and a popular size range including capacities of 3, 10, 25, 60, 125 and 300 gallons per minute.

For complete details, write for the new Pump Bulletin "PR-260."

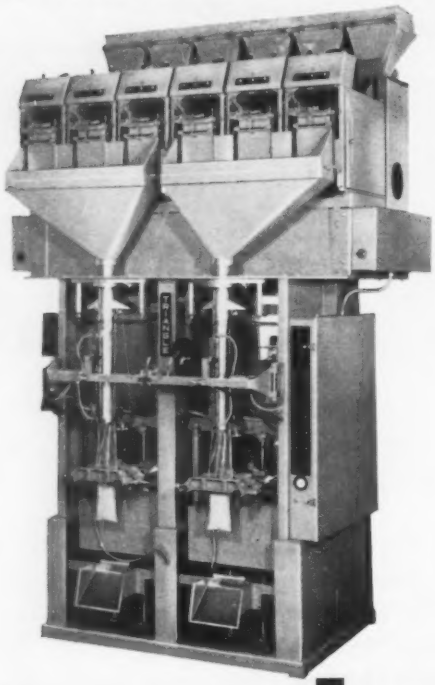
P461

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

TRI-CLOVER

IN CANADA: Brantford, Ontario
EXPORT DEPARTMENT: 8 South Michigan Avenue, Chicago 6, Illinois
Cable TRICLO, CHICAGO

Triangle Bag Maker Report–production speed up to 200 bags per minute.



more bags:

per shift... per shift... per shift

Minutes mean money. But don't judge a bag maker by a minute's performance. This can cost you plenty. It's day to day production run speeds—measured in cases ready for market—that mean profit. One reason so many have turned to Triangle.

Triangle Bag Makers are practical. Design incorporates the proven air/mechanical concept of operation . . . has for years. You don't have to pamper the machine to keep in time with production demands.

Dividend: better seals, more accurate fills, faster change-over, less down time, highest possible production run speeds with any heat sealable film you choose to work with. More important—more profit per package for *you*.

Watch a Triangle work. You'll see packaging speed without stress, strain, or watchdog attention. Write for the new Triangle Bag Maker Brochure. *Write: Triangle Package Machinery Company, 6637 West Diversey Avenue, Chicago 35, Illinois.*

TRIANGLE SINCE 1923

package machinery company

Superior performance through design simplicity

Present package comprises a foil tray with a polyethylene-lined paperboard plug lid crimped to a tray packed within a varnished, end-licking carton.

During this development, a variety of merchandising problems had to be overcome. Having a line of 30 products meant that few facings could be devoted to each item in the supermarket freezer case. As a result, products were subjected to sales limitations because of more frequent out-of-stock possibilities. Solution was to redesign the packages by varying background colors of illustrations and emphasizing product identification so that stock clerks could more easily recognize out-of-stock items.

Original market tests revealed that customers first chose the Stouffer line before picking a particular product. This meant designing packages so that they would group well together and lend to mass display. Packages had to be the same lengths and widths although depths could vary for different products without losing the advantages of neat, mass-like displays.

Designing packages to be the same width and length presented obvious problems. The Swiss steak, for instance, had to be chopped from 5½x7 in. to the standardized 5x7 in. size. Solution was to change the shape of the steak by trimming and adding thickness.

Mass Display

During early package development, many Stouffer packages carried red, green and brown colors that were closely keyed to various products. However, this concept defeated the pull of mass display and now all freezer cabinet Stouffer items look alike. Only difference in the primarily red packages is the product-in-use pictorial. Here, colors vary with items for easy product identification as well as taste appeal.

After once deciding that product-in-use illustrations offered the most attractive design for its packages, Stouffer continually reviewed this concept and changes followed changes. For example, the original subdued and out-of-focus pictorial background on the Lobster Newburg package is now a sharper, cleaner and more quickly identified design. Pictorials, type, and other phases of design are regularly reviewed for such improvements. (End)

Practical Ideas

Spotting Bad Commutators In Fork-Truck Motors

Commutators in electric fork truck motors should be visually inspected at least every 1,000 hr. to detect burned or dirty units.

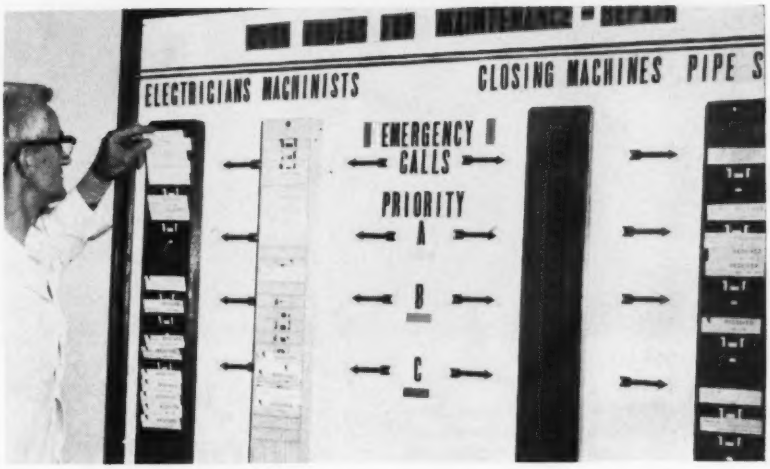
Commutator is all right if its color is uniform, ranging from copper to dark brown. If color is mottled, unit should be cleaned because dirt causes high resistance, arcing, and heat buildup. Slight uniform markings are no cause for concern.

If commutator is burned or shows signs of metal transfer, thrown solder, or grooving, it should be repaired or replaced. If there are two burned marks, 180 deg. apart, which show a definite brush outline, commutator has been burned from motor stalling and should be repaired or replaced. Then, take steps to prevent overloading of truck in future.—*Clark Equipment Co., Battle Creek, Mich.*

Tasty Sanitation Posters

Colorful posters, such as shown above, are developed by Tasty Baking Co., Philadelphia, the concept and artwork being done by the company itself. Physical production of 100 copies at a time, for posting all over the plant, is done outside by the silk-screen process.

The company changes the posters every four months. Its bakery safety program involves training foremen and supervisors in first aid.



Card Racks Show Repair Job Sequence

When you have a lot of maintenance jobs—some all at the same time—getting them done in a systematic manner can be a serious problem.

But Libby, McNeill & Libby Co., Chicago, solved it with wall-mounted, time-card-type racks, as shown above. They put repair jobs into four categories: Emergency and three stages of priority. They also "tell" who is to be assigned to each job.

Mounted on the office wall of the Maintenance & Repair Department are four racks, each holding 24 work cards. Racks are color-coded for easy recognition of jobs according to type of craft involved. Green rack holds work cards for electricians, yellow for machinists, red for closing-machine mechanics, and blue for steamfitters.

Cards slipped into racks are also color-identified according to job urgency. Employed are red card clips for emergency jobs, yellow for 1st priority, blue for 2nd priority, and green for 3rd priority.

Foreman or line operators phone the Maintenance & Repair Department when equipment or facilities are in need of repair. A work card is then prepared, color-clipped (according to nature of priority) and slipped into the appropriate rack. If job's one of an emergency nature, maintenance office personnel contacts one of the craftsmen by phone or radios a group leader in the plant. If called by radio, he goes to the nearest phone and gets the message without anyone else hearing the call. Employed in latter case is a central transmitter (in maintenance office) and six transistor-powered receivers no bigger than a package of king-size cigarettes.

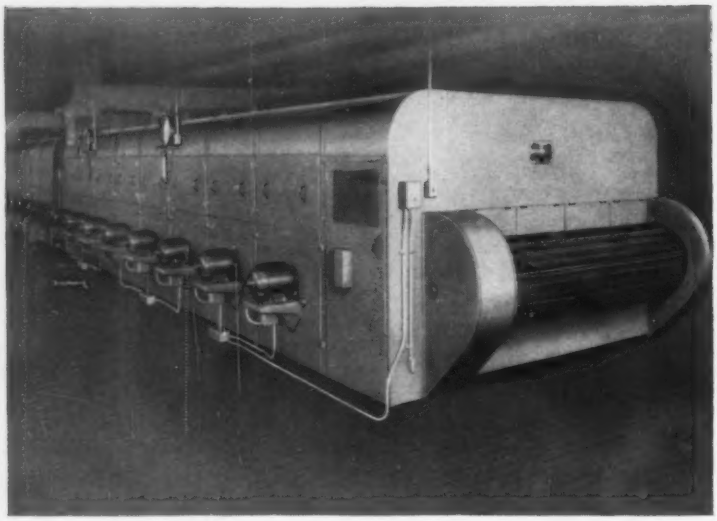
Reaching the craftsmen is simplified in still another way: They wear colored caps that identify them according to their specific craft. This way, they can easily be spotted throughout the plant, and directly contacted whenever there's a nearby emergency.—FE Staff

System Converts Sugar To 70-Brix Syrup

Unique handling of bulk sugar has cut costs at Vernell-Thompson Candy Co., Seattle, Wash.

Formerly, sugar was received in

Tomorrow's Dryer...Today!



by

SARGENT

UNIFORM DRYING of even those difficult foods with high water content — sliced potatoes and apples, for example. No unevenly dried areas — every slice is dewatered uniformly, safely, to the exact moisture content required. Color and flavor are guarded by the SARGENT system of positive control of airflow, and of zoned temperature reduction, to conform with progressively lowering moisture content of foods being dried. Production rate may be as high as you wish, with product quality protection unimpaired.

SARGENT exclusive design is geared to your product needs. The sturdy housing of a SARGENT is vibration free, streamlined; and operation of the dryer is dependable, trouble free, completely automatic. Every machine has a firm performance guarantee. The economy of a SARGENT, from cost-saving, record-quick installation, through steady quality production, to the easiest cleanout ever, cannot be equalled. Every machine has many SARGENT-engineered exclusive features to help you to easier, more economical drying of, a better, more saleable product. May we give you details? Just write or phone us.

FOOD PRODUCTS DRIED BY SARGENT INCLUDE

MILK CURD	DOG FOODS
MILK POWDER	CAT FOODS
SLICED APPLES	ANIMAL FEEDS
SLICED POTATOES	COCONUT
SLICED ONIONS	COFFEE
RICE	COCOA
TAPIOCA	MALT
BREAKFAST FOODS	WHEAT
FRUITS	OATS
BERRIES	SHRIMP
NUTS	STARCH
PROTEINS	STUFFING MIX
SOY BEANS	BIRD SEED
COTTON SEED MEAL	GARDEN SEED

EXTRUDERS • GRANULATORS • FEEDS (Oscillating Conveyor, Hopper, Standard)
DRYERS (All types for production, Pilot Plant and Lab) • COOLERS

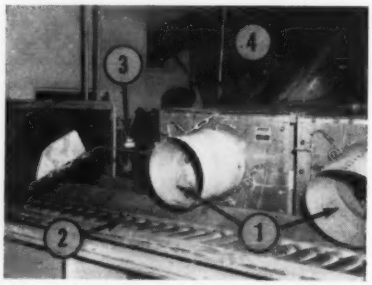
C. G. SARGENT'S SONS CORPORATION
Graniteville, SINCE 1852 Massachusetts

PHILADELPHIA • CINCINNATI • CHARLOTTE • ATLANTA • HOUSTON • DETROIT
NEW YORK • CHICAGO • LOS ANGELES • TORONTO

liquid form at 66½ Brix. Now, granulated sugar is received in bulk and converted to liquid sugar at 70 Brix within the plant. This saves 10c. per cwt. in sugar cost, cuts cooking time 10-15% (less water to boil off).

Granulated sugar arrives at the plant in 40,000-lb. pneumatic transfer trucks and is blown into a 3,500-gal. stainless-steel batch tank at 1,000 lb. per min. The tank contains about 1,000 gal. of tap water initially, and this is increased to some 1,350 gal. as sugar enters. The mixture is agitated constantly from the bottom by a 23-in.-dia. propeller driven by a 5-hp. motor.

After sugar is dissolved, syrup is pumped to a 10,000-gal. storage tank, where it is agitated during storage to keep the sugar in solution. For use, syrup is circulated through an overhead loop, which is tapped at five points for various processing.—*FE Staff*



Eases Spud Inspecting

Inspecting potatoes discharged from peelers, returning the unpeeled ones, and handling trimmings used to be problems at Hiland Potato Chip Co. Not any more, though, since we've installed our multi-conveyor inspection system.

The new system operates this way: Spuds are gravity-discharged from two abrasive-type peeling machines (1, in photo) onto a 1½ x 15-ft live roller conveyor (2). In traveling on this conveyor, potatoes are tumbled so that their entire surface can be easily inspected by girls, who cut out eyes and trim.

Trimmings are conveyed by 4-in. wide rubber belt to a food grinder (3), where they are ground and water-flushed into the sewer. Spuds in need of further peeling are returned, via reverse-traveling belt (not shown) and inclined flight conveyor (4), to the peeling machines.—*N. C. Rasmussen, Plant Manager, Hiland Potato Chip Co., Des Moines.*

Doing It Better

ARDEN FARMS CO.

Saves With Prefab Reefer

Use of prefab panels of galvanized steel and polystyrene insulation has cut both building and operating costs for Arden Farms' cold-storage room at its San Francisco plant.

The walk-in cooler, 48x22 ft. with 9-ft. ceiling, houses up to 10,000 gal. of packaged ice cream. It was built in hours, operates at about —15F. with low electricity bills, and can be expanded or dismantled with ease.

Room's foundation was laid with 6 in. of foam insulation between two layers of cement. Then a 4-man crew erected the building in three work shifts. A single truck brought all the materials required.

The 94 panels used for walls and ceiling are composed of 8 in. of polystyrene sandwiched and sealed between two sheets of steel. The insulation is particularly effective because it consists of millions of small, dead air spaces, and it resists water, fire, and vermin.

This insulation (Styrofoam) is made by Dow Chemical Co., Midland, Mich. **(202)**

PURITY BAKING CO.

Cuts Cleaning Costs

Resin-lined pneumatic flour-handling equipment has cut cleaning and maintenance costs at Purity Baking Co., Charlestown, W. Va.

In operation, flour passes from silos into an adapter where air introduced under pressure forces it through 300 ft. of 3-in. tubing to a bin. Adapter, tubing, and bin are lined with resin (Lastiglas).

Lining's smoothness permits free flow through pipes and free fall of flour from side walls, thus provides a virtually self-cleaning system. The contamination- and corrosion-resistant lining material is made by Bishopric Products Co., Cincinnati. **(203)**

TWO STURDY BINS are filled with beans by automatic harvester, then quickly trucked to the plant.

AT PLANT, rotary dumper empties the 880-lb. bin load. Beans are conveyed directly to processing.

SEABROOK FARMS

Cuts Harvesting, Handling Costs With Bin Boxes

Hardwood bin boxes speed and simplify bulk handling of produce at Seabrook Farms, Seabrook, N. J.

In automatic harvesting of snap beans, for example, two boxes (Dura-Bins) are used with each unit. At the plant, they are handled by fork trucks and emptied by rotary dumpers. Seabrook has some 2,500 boxes, of which about 700 are used daily.

A major requirement of the boxes is rugged construction to withstand rough handling in the field and shipment over rough roads. Special fasteners (Klimp) at corners and bottom of box absorb shock, thus curb bruising of produce. Flexibility is also a must, and the fasteners permit easily disassembly of boxes for storage or occasional repair.

Units were sized to conform to the company's operations. Inside dimensions are: 37½ in. long, 47½ in. wide, and 33⅝ in. deep. Bins hold about 880 lb. of beans, 1,300 lb. of corn, 1,500 lb. of potatoes, and 1,000 lb. of squash.

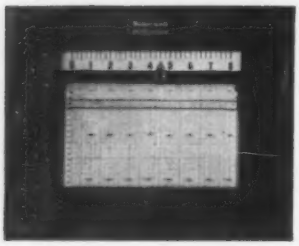
They are supplied by J. H. Dunning Corp., Darien, Conn. **(201)**

John Krauss, Inc., Jamaica, N. Y., packs four different carton sizes of bacon and sausage on one machine. Compact unit (Tux, Jr.) is readily adjustable and easily moved from one product line to another. It is leased by Marathon Div. of American Can Co., Menasha, Wis. **(206)**

California Almond Growers Exchange, Sacramento, accurately weighs 150-lb. batches of almonds from a continuous 30,000-per-hr. stream. Automatic bulk weigher has a special radial inlet gate and chute brush seal to curb product damage and prevent leakage of unweighed nut meats. Unit is made by Richardson Scale Co., Clifton, N. J. **(207)**

Mickelberry Products Co., Detroit, has lavatories immediately adjacent to meat-processing areas. This simplifies compliance with sanitary codes and saves washup time. Units were supplied by Bradley Washfountain Co., Milwaukee. **(205)**

For more information, circle key numbers on Reader Service Card, back of book



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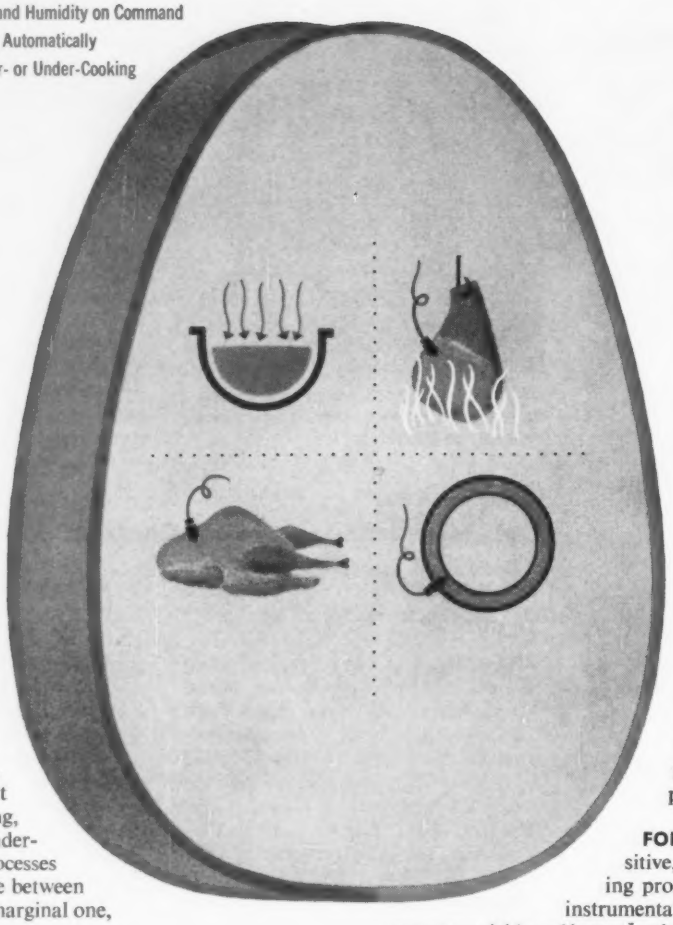

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SANITARY AIR-ACTUATED VALVES

Their use in process control and CIP is boosting production efficiency. Here are prime pointers on the various types—construction, operation, and application

AIR-ACTUATED SANITARY VALVES can do jobs other valves can't do. Moreover, new applications are being developed—some under wraps.

Often, a frustrating obstacle to automating a process is some operation that seems to defy mechanization. In one case, it was sanitary flow proportioning and formulating. An accurate sanitary throttling valve was needed to match precision of measurement and to effect control.

True, sanitary valves of the on-off type were available, but the above application required varying the flow over a wide range of control signals. Problem was to achieve this throttling action with a sanitary valve.

Until sanitary, air-actuated valves were adopted by the food industry, particularly for CIP, two basic sanitary valves were employed—the compression and ground-seat plug type. However, these valves had shortcomings.

Compression valves comprise a valve rod and disk operating within a body to contact one or two seats. Employed are metal-to-metal and rubber-to-metal, disk-seat combinations. While these valves operate successfully with air- or electric-type mechanical actuators, they have not proved satisfactory for CIP.

Plug-type valves control flow by aligning holes in plug and body when the plug is turned. To prevent leakage, surfaces on plug and body are finely ground and lapped. However, this design is not suitable for CIP cleaning or mechanical actuation.

At this stage, the compression valve was redesigned to become the new sanitary valve by:

. . . Eliminating all crevices due to close metal-to-metal contacts for positioning or aligning.

. . . Minimizing or abolishing dead areas from the major flow path.

. . . Making all gaskets flush on inside surfaces.

Air-actuated valves were first introduced to the food industry in '50. At that time, they were employed in the Martin aseptic canning process which utilized a combination of the principles of HTST sterilization and aseptic canning. They played a significant role in handling pumpable products successfully processed through heating,

FE Staff

10 Ways Sanitary Air-Actuated Valves Benefit You

1. **New speed and smoothness in flow of materials.** Higher product-flow rates with start-stops accomplished more efficiently and without product loss due to leakage.
2. **Quality boosted.** Formulas held to closer tolerances because these valves provide positive, instant shut-off.
3. **Greater production.** Scientifically applied processing and in-place cleaning techniques permit maximum use of processing equipment.
4. **Output per man-hour increased.** Human error is virtually eliminated, hence less supervision is required in processing or cleaning systems employing air-actuated valves. No special technical skill is needed, and training of operators can be quickly accomplished by plant operating supervisors.
5. **Maintenance reduced.** Air-actuated valves are practically trouble-free because they can be cleaned in-place, so manpower is released for other jobs. With wear and tear on valve components reduced, maintenance is limited to periodic routine inspection. Simplicity of design also minimizes valve repair or overhaul.
6. **Plant sanitation improved.** Cleaning time and costs are slashed. Effluents and product waste are minimized.
7. **Working conditions more pleasant.** Because lines and valves can be cleaned in-place, plant is more sanitary and floor is kept dry.
8. **Process flow mated with advanced automated CIP system.** A big bonus is achieved through installation of valves that can be tied into the two systems.
9. **Operations automated.** Valves are designed to respond immediately to air or electric switch-type controls, or to be programmed through central control panel.
10. **Processes remotely controlled.** This may be achieved from a central panel or from anywhere in the plant.

holding, and cooling sections of a closed heat-exchange system.

In '51, air-actuated valves proved the answer to mechanized cleaning of dairy-plant pipelines. Then, Lucerne Milk Co., Oakland, Calif., put into operation the first CIP-pipe system.

Current Types

Today, there are many uses for sanitary valves in CIP and process control as well. Considerable basic redesign has provided the food industry with a variety of three basic types of line valves—divert, throttle and shut-off.

They are now teamed with:

. . . **Sanitary flow meters** or electronic load-cell-supported weigh tanks to proportion ingredients to and through process units, or cleaning solutions through CIP circuits.

. . . **Electrical timers** to sequence a variety of complex operations.

. . . **Temperature-measuring** instruments to improve thermal process control.

Control of product flow is also providing a positive approach to continuous standardization of pH, solids, fat, etc.

By assuring pushbutton or panel-board control of product flow from any plant location, the valves make completely automated installations in sanitary lines practical for food and beverage operations. Typical are recirculation of detergents, sanitizing agents, and rinse waters for CIP installations, and integrated batch-sequencing of ice-cream and soft-drink ingredients.

Units operate on air pressure supplied from any part of the plant, and are controlled either by pushbutton or as part of a pre-set automatic cycle. A visual signal of each valve's position (on or off) permits full control of product transfer from anywhere in the plant—no matter how remote from pipe location.

Sanitary valve construction is simple and rugged for long uninterrupted operation. Units require a minimum of maintenance, and are constructed of stainless steel, seats flush with outside ports.

They are available in either direct- or reverse-acting types in single or double position. Direct-acting valves close upon application of air pressure. Releasing the pressure opens them. Reverse-acters remain closed until air pressure is applied, then return to closed position when pressure is released.

These valves, along with their associated pipes, fittings, and pumps, conform to 3-A Dairy Standards. Valves and their pipe connections are now available in smooth stainless steel as well as rugged, seamless plastic and combination rubber-plastic.

A typical electro-pneumatically operated valve is actuated by pushbutton or electrical controls from a panelboard. A solenoid controls the valve-actuating air supply, hence also the actuator's piston or diaphragm. Operating time ranges 1-3 sec.

The actuator is built into the valve. Air fed to the diaphragm, usually at 20-50 psi., either opens or closes the valve, depending upon whether it is direct or reverse acting.

Special valves have been designed to operate at pressures to 100 psi. They need more thrust for shut-off when confronted with high product pressures. Because of valve's sanitary design, its seat area is large, hence it requires greater-than-average thrust.

Sizes of actuators and valves vary. For example: A 4-in.-dia. actuator operates 1½- and 2-in. valves, while a 5-incher serves 2½- and 3-in. valves.

Actuators also come in different styles. Generally, they are of the piston or diaphragm types. Both may be normally opened, with air to close and spring to open. Or the piston-type may be normally closed, with air to open and spring to close, air to open and close, or 3-position split flow (open, close and/or intermediate).

Valves are of the take-down or cleaned in-place types. They are designed for multi-directional operation—product flows in one port and out one or more. They are available in tee, cross, tee-tee, cross-tee, or cross-cross body combinations, also with threaded, quick clamp, or butt-weld parts.

Shut-off valves are available with a tee body for 2-way operation (product in one port and out the other), or cross body (one port opposite the other), for 3-way operation (product in one port and out two). For a complex valve-

pipeline hookup, four cross-body valves might be used along with a tee-body valve for feeding product into five tanks.

Divert valves come with an upper and lower cross-body for 3-way operation, upper tee and lower cross body for 4-way operation, upper cross and lower tee body for 4-way operation, and upper cross and lower cross body for 4-way operation.

Throttlers also shutoff or divert. Shut-off throttlers have either a tee-body for 2-way operation or cross body for 3-way operation. A throttling divert valve has an upper and lower tee body for 3-way operation.

Of special design is the diagonal valve that provides a full opening without changing direction of flow. Such a valve finds specific applications, such as minimizing the brushing of whole fruit while transferring strawberry jam from vacuum pan to filling machine.

One of the newer valves has no springs. It is air-operated in both directions—air to open and close.

Applying air pressure to the actuator of a 2-way valve (air to raise) opens the valve. Actuator's heavy-duty spring provides a positive "fail-safe" feature in event of air-pressure loss.

Re Air-Actuated Sanitary Valves

Outstanding Features:

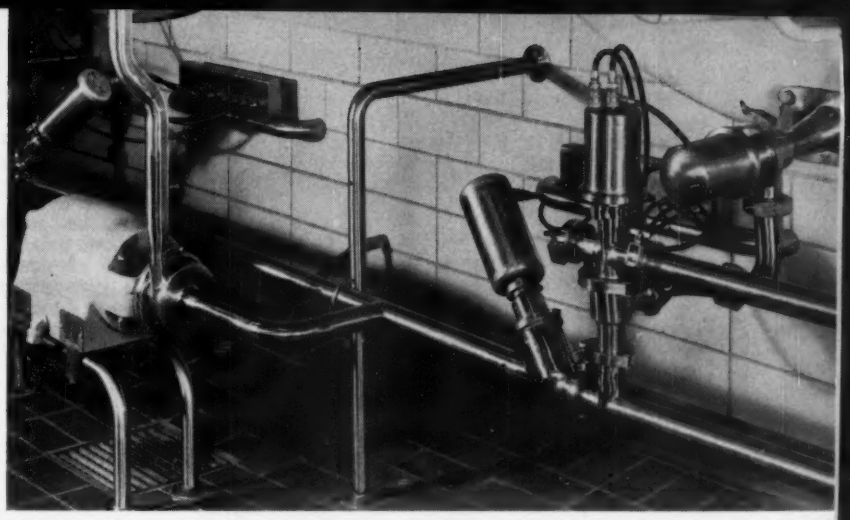
Fast action, quick take-down, long life, quick cleaning, positive sealing, sanitation, and rapid re-assembly.

Typical Applications:

Tanks, pipelines, CIP systems, cookers, kettles, evaporators, filters, separators, pasteurizers, heat exchangers, emulsifiers, mixers, blenders, hoppers, deaerators, filling, forming, and coating machines.

Products Handled:

Dairy products, margarine, lard, peanut butter, soups, certain canned foods, preserves, pie fillings, icings, confections, mayonnaise, dressings, liquid sugars, sauces, gravies, certain frozen foods, beverages, beer, wine, fruit juices, vinegar, liquid eggs, syrups, and meat emulsions.



HEART of this CIP and process-control system are the remotely operated, air-actuated valves (right) that monitor flow of products or cleaning solutions.

Three-way valve combinations are designed for flow-diversion applications. Product enters common port, flows out another. Application of air pressure then diverts product out of still another port.

Out Went "Take-Downs"

Trouble with take-down type pipelines is that they must be disassembled, washed and rinsed, reassembled, and sanitized. But with the introduction of permanent pipelines, savings in excess of 50% in labor required to clean and sanitize lines became a reality.

Then, in '57, one dairy firm made striking strides—CIP refinements and innovations that included pushbutton control and extension of automatic cleaning (with use of air-operated valves) to storage tanks and road tankers.

Dual system was set up for simultaneously cleaning either two pipelines or storage tanks, with product and recirculating lines connected. In all, there were 590 ft. of stainless, welded pipelines (2-in.) and 19 tanks. Automatic controls took over to deliver clear water, alkali solution, and compressed air in timed sequence.

Cam programmers, instead of formerly used electric clocks, timed the cleaning sequence. While rotating, each cam energized or shut off its solenoid relay which, in turn, controlled air valves that opened or shut spring valves. In addition, programmers controlled operation of solution feed and return pump.

Valves for Process Control

You're going to hear a lot more about using air-actuated valves in food processes engineered under automatic sequence control.

Controlled processing of fluids flowing continuously through pipes and heat-exchangers and multi-step processes has accelerated their use. From multi-step in-place cleaning and processing to single-step filling operations, air-actuated valves are being used more as production traffic cops.

When several processing actions must be followed, in sequence, at the right time and under a specific set of conditions, it is expecting too much of even the best operator to perform day in and day out on a foolproof basis. Yet, perfection is required if product quality is to be maintained, waste and spoilage avoided.

Miller Brewing Co., for example, has been using air-actuated valves to control product flow from a battery of filters to an electrical turbidimeter.

This system of six valves (Ladish-Fesco) provides exacting control of beer clarity—plus the following three advantages:

1. Economy in control. Valves are time-sequenced to control product flow from six sources through a single turbidimeter rather than a number of them.

Usually, a single instrument would be used to measure and record clarity of beer discharged from a plate-and-frame filter. Such was the case when the Milwaukee brewery installed its first turbidi-

AIR - ACTUATED VALVES (A) are automatically time-sequenced to control beer flow from three filters through a single turbidimeter (B). System also checks turbidity of unfiltered beer and clarity of filtered blend.

meter. In company's present installation—and there are several —one turbidimeter monitors the clarity of beer from three filters. In addition, it checks the turbidity of unfiltered beer as well as a filtered blend.

2. Easy operation. The recorder tells the clarity story. Periodically, operators scan the recording chart which signals the first sign of change in clarity. They know the status of quality at all times, and can take quick action if beer shows any sign of increasing turbidity.

3. Time saving. Samples no longer have to be collected for lab-checking.

The automated flow control setup comprises a manual-off, automatic selector switch; 6-point tap switch (when originally switched manually); 6-pole cycling times; six solenoids to actuate as many pneumatically operated valves; turbidimeter; and recorder.

System operates with three filters to sequence-time the flow of beer from five sources to the turbidimeter. Sixth solenoid-actuated air valve serves to vary the flow from any of the five sources. One source, for example, would have to be set for a longer timed flow than the others.

Flows may be timed to turbidimeter in this way (depending on known performance of filters, etc.): 10 sec. for filter No. 1, 10 sec. for filter No. 2, 10 sec. for filter No. 3, 10 sec. for unfiltered beer, and 20 sec. for filtered blend.

Timer motor's drive shaft makes one revolution per hour to make and break contacts on six switches. Latter energize solenoids that actuate air valves at 30 psi.

Role in Automated CIP

The switch from manual to automated CIP systems was accomplished with process pipings divided into tank- (open) and line- (closed) cleaning circuits. Supply lines to these circuits originate from a central control panel, in which are located pump, make-up tank, cleaning and sanitizing solutions, and controls.

Basically, an open-circuit system involves spray cleaning of tanks, while a closed system refers to the line cleaning of processing equipment (other than tanks). Main difference is in pump's operation: A series of burst pre- and post-rinses when spray-cleaning tanks, and continuous operation on line circuits.

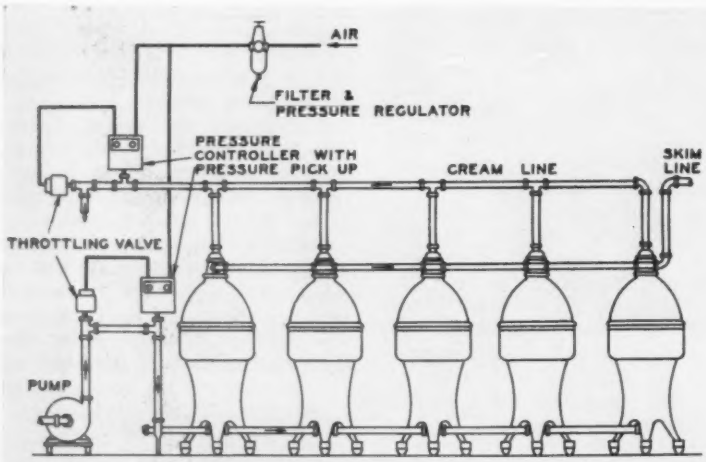
Example of open-circuit system: Cleaning a storage tank with CIP unit's pump delivering cleaning solutions and rinses to spray headers mounted in tank and another pump returning solutions from tank outlet to unit.

Closed-circuit system: Cleaning a raw product line with unit's pump circulating solutions through line and back to CIP unit.

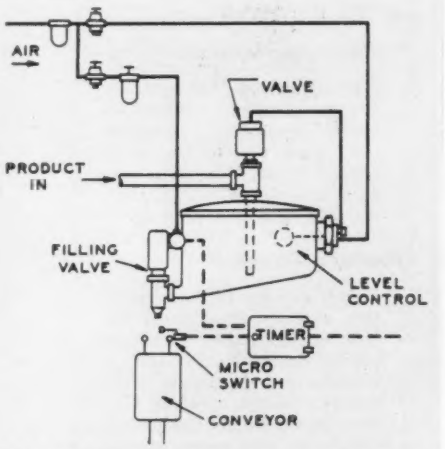
Cleaning programs vary with each circuit. Hot and cold raw milk lines, for instance, require different chemical concentrations, times, and temperatures. Length of a circuit and amount of soil to be removed influence the program.

Automatic controls open and close appropriate air-actuated valves in solution lines, make-up tank, drain, and steam lines. In a typical operation, solutions (acid, alkali, chlorine and/or water conditioner) are prepared in make-up tanks or a multi-compartment tank.

To clean storage tanks, for example, air valves operate so that



CONSTANT-PRESSURE CONTROL: Air-actuated throttling valves on milk and cream lines are actuated by pressure controllers to maintain constant pressure on this battery of cream separators. (Ladish diagram)



FILL-CONTROL system uses product-level control, throttling and filling valves, and timer. (Ladish diagram)

Controls Necessary for Automated CIP

Efficient operation of a CIP system and its valves calls for:

. . . **Temperature recorder** that also records solution circulation time.

. . . **Temperature controls** for rinse water and solutions.

. . . **Thermoswitch** in circulating line (directly after steam and water mixing chamber) to shut off the system when temperature exceeds 200F.

. . . **Chemical-solution** control to maintain solutions at proper concentrations.

. . . **Safety control** to add cold water gradually while cooling cleaned tanks to prevent them from collapsing.

. . . **Timers** for controlling each cleaning cycle and circuit.

. . . **Repeat-cycle** control to correct for accidental cleaning-cycle interruption.

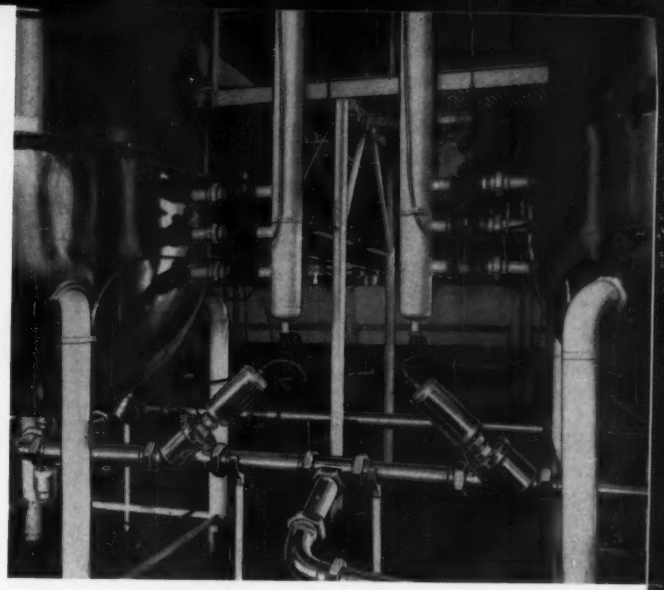
. . . **Foolproof system** of locking controls to prevent change of program without knowledge of management.

. . . **Provisions to sterilize** any circuit with 180-F. water or sanitizer.

. . . **Oscillation control** for actuating air-operated valves during each cleaning cycle to clean valve's stem, bonnet, and "O" rings thoroughly.

. . . **Control system** that is flexible for field changes (circuit, chemical, time, or temperature) due to additions, process changes, etc. Simultaneously handled multiple functions are controlled through variable time intervals.

. . . **Product-protection** system to prevent starting CIP cleaning when lines or tanks contain product.—**E. Kuhles, Ladish Co., Fesco Div., Barrington, Ill.**



FROM VACUUM PANS, flow of cooked preserves is air-valve diverted to surge tanks supplying fillers.

solution tank introduces water for rinsing and washing. Liquid-level probes control water at two different levels, also close solution tank's discharge valve after water is transferred at start of tank-wash operation. Solution tank is by-passed during recirculation washing of storage tank. It is done by draining water from tank being cleaned through a valve manifold and into recirculating pump's suction side for discharge back through storage tank's spray head.

Specialized CIP Systems

For specific equipment, special CIP systems employing air-actuated valves have been designed. Take, for example, an evaporator set up to operate 22 hr./day, with the remaining 2 hr. for CIP. Equipment is sterilized by pumping sanitizing solution as a direct follow-up to cleaning. Employed is a panel board-mounted selector switch set up for the entire cleaning-sanitizing cycle. System is designed so it won't reclean (go through two cleaning cycles) without sanitizing.

In evaporator-CIP hook-up, liquid feed and draw off require air-actuated valves tied to CIP controls. Valves maintain constant head in evaporator and, the longer product remains in unit, the more water drawn off during concentrating. Throttling-type air valves also automatically shut off outlet or modulate outlet flow to desired degree of product concentration.

A simpler CIP system has been designed without automatic valve controls. Here, air valves aren't needed in a spray pan hook-up, just three solution pumps sequenced by three electric timers.

Pulse Cleaning

Industry has gone a step further toward cleaning valves better. At Borden's new Milwaukee dairy (FE, July '60, p. 44), valve-pulsing controllers (Taylor) were mounted behind its four automatic CIP-control panels. Their function is to pulsate process flow control valves while cleaning solution is flowing through line. As valves pulsate, they and their stems are thoroughly cleaned.

They pulsate during all steps of cleaning cycle at frequencies of 15 to 60 sec. Program controller's timing dial triggers valve pulsations. Timer also selects appropriate pulse rate for each cycle step in progress.

When the cleaning circuit comprises valves and tanks, an external selector switch automatically keys in pulsing panel only during line cleaning.

Requirements Met

Sanitary, remotely operated, air-actuated valves have opened up new opportunities for automating processing operations because they meet the following requirements:

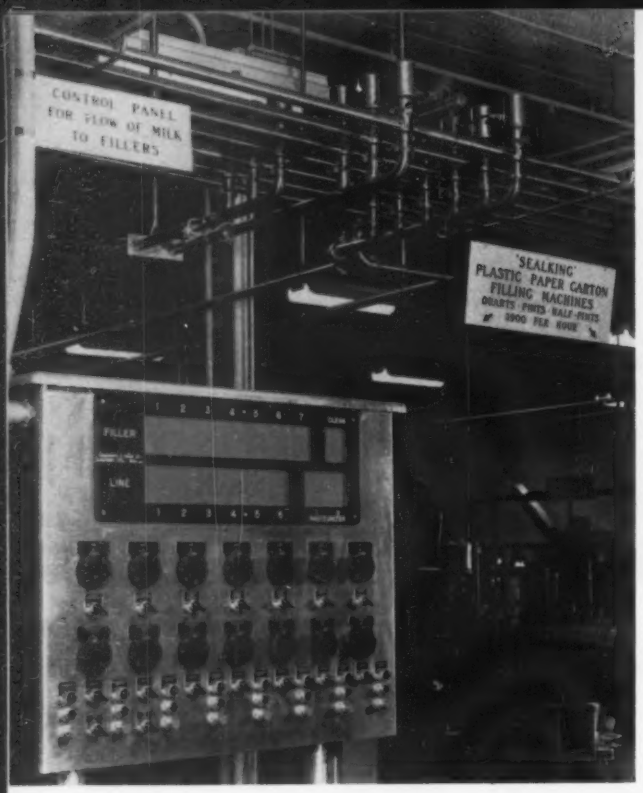
. . . **Operating economy** through special design for cleaning in-place piping systems. Hand-operated valves would work only in simple CIP'ing systems employing only a few valves.

. . . **Opening and closing valves** many times during the sequence of rinsing, alkali and acid washing, and sanitizing during CIP cycles.

. . . **Properly synchronizing** operation of these valves with others in system to avoid water hammer and to assure cleaning.

. . . **Fitting them into centralized control systems** automating processing operations from a central panel. Panels usually are of the graphite type. Diagrams on panel show valves, for example, controlling flow between a tank and a heat-exchanger. Pilots behind valves light up when operator

SANITARY AIR-ACTUATED VALVES



CONTROL PANEL sets remote valves to channel product flow to fillers. Seven dial-type selector switches (digital) monitor a total of 68 pneumatically operated valves.

turns switch that opens valves. Light signals operator that valves are open.

Graphic-type control panels are usually located at points of greatest processing activity—in a dairy, near UHT, filler, or by-products' operations. Each of several panels are interconnected so that operations taking place under control of an operator at one station are indicated on panels of others.

Here, too, switches at more than one panel can operate same valve. Some valves are even interlocked so they can be opened at any station, but closed only if switches at other stations are in off position.

Flow diagrams may also comprise a chart to permit operators to signal product information to one another. Typical is the signaling that a storage tank holds homogenized milk. Operator then simply flicks selector switch for this tank to product position on chart.

Process-area controls are also superseded by a centralized automated CIP control station, through which all area-control circuits are closed. Thus, area control no longer operates when CIP takes over.

Automated CIP is accomplished through piping that separates tanks and processing lines into a number of circuits. Typical in a dairy plant is the 4-circuit separation of raw milk tanks, raw milk supply, pasteurizer-to-filler, and by-product mix tank systems. Each circuit is separately cleaned by operator simply flicking a position switch on panel.

What's more, each circuit may have several sub-circuits. They are set up, through remotely operated air-actuated valves, for time-sequenced circulation of rinses and cleaning solutions in accordance with CIP program.

As a safeguard, interlocks are being engineered into newer CIP controls to make sure piping changes are properly made in setting up the separate circuits. Moreover, safety interlocks are being tied into tank gages to prevent CIP in a tank circuit unless tank is empty.

Today's lines are easily converted for circulation of cleaning and sanitizing solutions. And they're sloped (minimum of 0.05-in. pitch/ft.) for easy drainage of products and cleaning solutions.

Lines feeding a battery of storage tanks, pasteurizers or processing vats are effectively circulated through use of 3-way-type air-actuated valves at each unit's entrance. During cleaning, these valves are activated into through position, and an auxiliary line carries solution back to recirculating unit.

When diversified, complex manifold systems employ 3-way valves, crosses, and short pipe lengths. Just as long as manifolds comprise an even number of lines, recirculation cleaning is easy, but odd number of lines necessitate an auxiliary pipe.

Trend toward using valve clusters (manifolds) is eliminating long headers, depending upon equipment arrangement. It is also simplifying the use of electrical wiring and air-distribution.

Effective cost-reduction is now being realized through simpler installation of valve and pipelines. Common practice on a tank set up has been the use of a pair of air-actuated valves connected with each other by a bypass jumper. In this case, topmost valve is used

Valve's Control Functions

Pneumatically-operated valves are actuated by switches—manual air-type (toggle, knob, or lever) or electric (foot, rotary, or pushbutton) — or by solenoid valves (manifold, normally opened, or normally closed).

They are used in conjunction with a wide variety of control equipment:

1. **Level controllers**—Float- and electronic probe-types (open- and closed-tank mounting).
2. **Differential-pressure units.**
3. **Temperature controls** — Thermocouple, resistance, bulb-filled and bimetallic switch.
4. **Pressure controls** — Switch, diaphragm (pneumatic or hydraulic) and strain gauges.
5. **pH controls**—Probe- or conductivity-types.
6. **Timers**—Delay, program, electric, pneumatic, electronic, and punch card.
7. **Weight controls** — Load cells (electronic, pneumatic, or hydraulic) and scale (with switch).
8. **Proportioning control** — Flow meters, pressure differentials.

for filling, while bottom is for emptying tank.

Newer trend is use of a single bottom-located valve for both filling and emptying purposes. Eliminated, here, is the jumper and daily need to clean, disassemble, and reassemble it. Moreover, tanks have fewer openings.

Role in Welded Lines

Inherent disadvantages of conventional nut-and-ferrule assemblies for CIP lines led to the installation of the first all-welded stainless lines back in '48. Soon after, other welded lines appeared in West Coast dairy plants.

Chief advantage of this pipe construction: Its smooth, continuous internal surface.

What spurred development of these economical, welded lines was the high cost of joints involved in CIP circuits. A good CIP-line joint is so constructed that gasket is positively aligned in a closed joint assembly to eliminate objectional drain-and-gulley conditions. Suitable sanitary gaskets are nontoxic and impervious to fat and moisture.

Permanent welded lines have proved helpful in cutting cleaning costs by abolishing dismantling for sanitary reasons. Employed is the same metal for welding as that of the pipe to produce a satisfactory weld. Sanitation is assured through a new means of grinding and polishing the inside portions of welds.

In a conventional, dismantled line, pipe lengths are connected by sanitary unions soldered or expanded on ends of each length. When installed in a line, it has often been necessary to insert a proper gasket in each union for purpose of preventing leaks. Outlets, valves, tees and bends are also normally soldered to the pipe or connected to the line with sanitary unions.

Makers of Sanitary, Air-Actuated Valves

Cherry-Burrell Corp., Cedar Rapids, Ia.

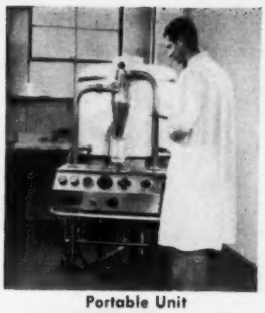
The Creamery Package Mfg. Co., Chicago, Ill.

G and H Products Corp., Kenosha, Wis.

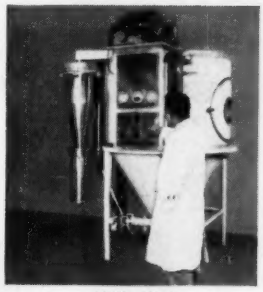
Ladish Co., Fesco Div., Barrington, Ill.

Alloy Products Corp., Waukesha, Wis.

A.P.V. Co., Inc., Buffalo, N. Y.

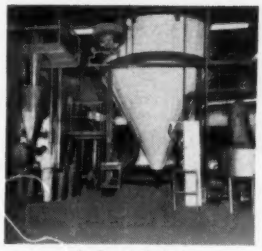


Portable Unit



Utility Unit

Pilot Unit



Industrial Unit

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The diversified dryer facilities permit research, testing and custom drying on the best suited scale. Tests may be started in laboratory-size equipment and progress in stages to full scale volume production or, research may be confined to any intermediate step. Analysis of raw material and finished product may be evaluated in our well-equipped analytical lab.

The four dryers pictured at the left are equipped with all stainless steel contact surfaces. Throughout the laboratories, process steam is furnished for the jacketed tanks and pipes. Modern receiving and storage facilities are available for all types of shipment.

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Nerco-Niro Spray Dryer Div.

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Nichols Engineering & Research Corp.

80 Pine St., New York 5, N. Y.

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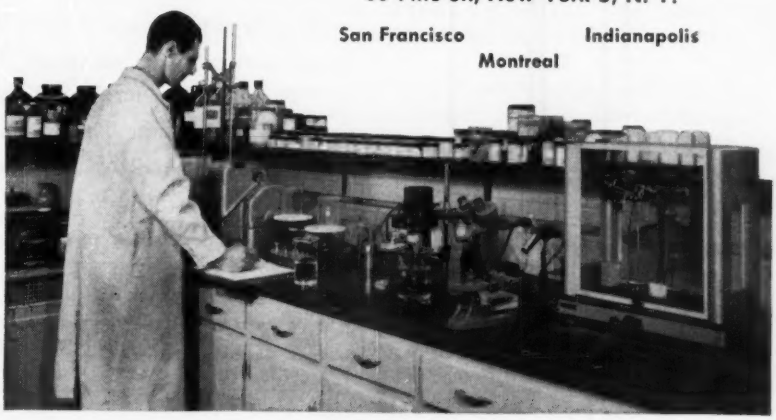
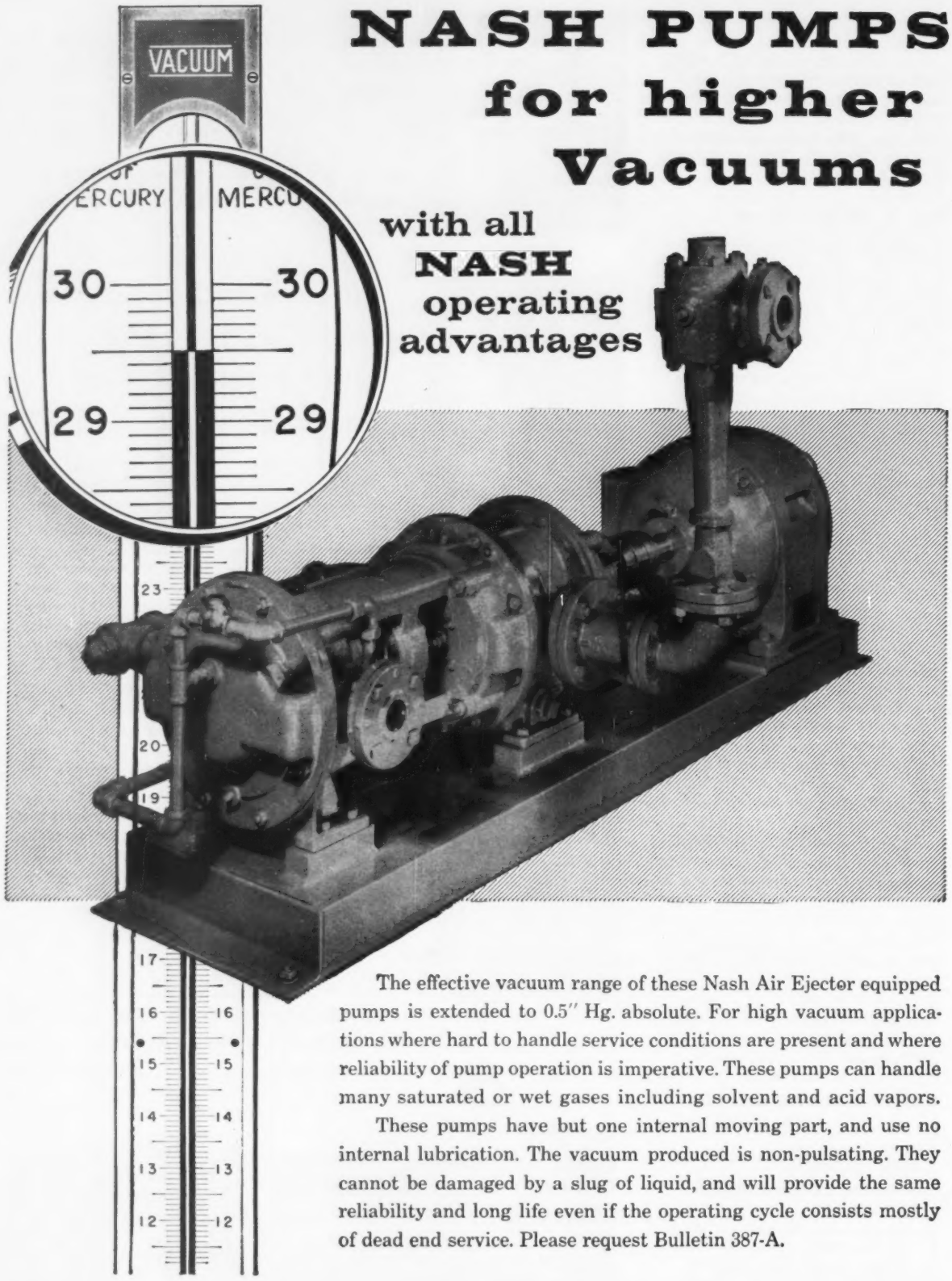


CIRCLE 75 ON INQUIRY CARD

NASH PUMPS for higher Vacuums

with all **NASH** operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

Marketing Signals

Holiday glow for profits

. . . Price cuts curbed . . .

Chicks top 'burgers

Food Profits Firm Up

As food companies neared the end of '62, profit prospects took on a holiday glow. A FOOD Engineering check of the financial statements of 46 food-beverage makers showed profits for the first 9 mos. 4.6% ahead of last year's rate.

Setting the pace are canners-freezers, with 11.5% faster earnings, and confectionery firms, net up 7.9%. Packaged foods hefted profits 6.7%, soft drinks 5%, and brewers 3.8%. Bakers continued to trail last year's pace with a sickening 13.3% profit fall-off. Dairy firms remained even with '61 levels.

'Top of the Stove' Target

Duck freezers hope to boost popularity of their product by marketing cut-up parts. That way, they figure, housewives won't be limited to oven roasting, will be able to use a wider variety of "top of the stove" recipes.

Sparking the promotion is the revamped Long Island Duck Farmers' Cooperative, whose 45 members reportedly account for 70% of the nation's $12-mill. duckling harvest. Gen. Mgr. George W. Lamb estimates that sales are evenly divided between home and institutional uses.

Helping out are Dow Chemical's Dobeckmun Div. and other suppliers. They're feeding recipes to media and sponsoring trade luncheons.

Tougher FTC Line on Prices

In a significant decision that has broad implications, Federal Trade Commission ruled that price cuts cannot be used to attract new customers. **The commission said that "good faith" defense in Sec 2(b) of Robinson-Patman Act applies only to price cuts made in self-defense against competitive attacks.**

Defendant Sunshine Biscuits was accused of granting 7% discounts to 4 customers, 5% cuts to 15, and no cuts to other customers. A trial examiner had ruled in favor of Sunshine, but the commission, 4-1, reversed him. The dissenting opinion held that no distinction should be made between "aggressive" and "defensive" cuts, and that such distinctions are "economically unsound."

Revolution in Food Likes

Hamburger and apple pie no longer rank as top meal-time favorites, according to a survey of 4,000 families over a 1-yr. period. Sponsored by R. T. French and other food firms, probe was carried out by Market Research Corp. of America.

Highlights: Most popular main meal meat dishes in order of usage are whole fresh chicken, beefsteak, ham, roast beef, and hamburger. Favorite main meal desserts are vanilla ice cream, vanilla white cake, chocolate cake, apple pie, and yellow gold cake. French feels that chicken's popularity is due to many ways it can be prepared as well as its adaptation to sauces and seasonings.

Drops Route Selling

Acting on the premise that distribution is best carried out by distributors, Curtiss Candy is discontinuing its route selling operation. Outfit will now market its line through regular wholesale channels as part of a new "total marketing program," says Adv. Mgr. R. H. Coirier.

Curtiss sees stronger trade and customer relations resulting from the move. To maintain sales support, candy maker will boost his field force by 20%.

Self-Service in Europe

While self-service food outlets in Europe soared from under 1,000 to over 36,000 in the '50s, growth rate differs from country to country. So observes Chase Manhattan Bank in its latest "Report on Western Europe."

Bank says self-service units represent 29% of grocery stores in Sweden, compared to 13.8% in Germany, 11.8% Norway, 8.8% Switzerland, 8.3% Holland, 4.7% Britain, 3.2% Denmark, 1.4% Austria, 1.1% France, 0.6% Belgium, and 0.1% Italy. In USA, figure is around 58%.

BRIEFS

Prepared Chinese foods volume now totals $300 mill. a year, according to Audits & Surveys.

How to measure advertising's profit contribution in relation to costs is themed in a new Assn. of National Advertisers' manual. Included are contributions by General Foods and Lever Bros.

New products added by Campbell Soup in past 5 yrs. now represent 18% of company's business; items unveiled in last 10 yrs., 33%.

Automatic food service continues to make new gains. Midwest's largest drug store chain, Katz, will install full line of food-beverage dispensers to supplement fountain service.

How *Sterwin* Puts More Profit Into Food Products!

If your food product requires enrichment, color, flavor... then STERWIN can help you save time, money, labor . . . so give you more profit.

For STERWIN offers unique extras in vitamins, colors, vanillin, and these superior ingredients are fitted into your production picture by experts with years of practical and technical experience. These STERWIN Technically Trained Representatives have cut time, expense, production steps for manufacturers producing a widely varied range of food products: candy, bread, margarine, soda, fruit juice, cereals . . . to name just a few.

STERWIN ingredients are delivered when you want them, in the quantity you need. Keeping delivery promises is a STERWIN tradition that helps keep your production at top efficiency.

For new production set-ups or to improve an existing one . . . see your local STERWIN Representative . . . costs you nothing . . . can profit you plenty.

You get these extras when you buy:

STERWIN VITAMINS . . . *the most complete line* in the field . . . immediate delivery in any quantity.

STERWIN COLORS . . . Parakeet Certified F.D.&C. . . . backed by a *highly experienced technical staff* to help you with your color problems.

STERWIN VANILLIN . . . pure, ZIMCO® U.S.P. Vanillin . . . *unlimited supply* of basic material from world's largest vanillin producer.

Sterwin Chemicals INC.

Subsidiary of Sterling Drug Inc.

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STOCKS AVAILABLE AT: Atlanta, Buffalo, Dallas, Denver, Evanston, Ill., Kansas City, Mo., Los Angeles, Menlo Park, Calif., Minneapolis, Portland, Ore., Rensselaer, N. Y., St. Louis.

CUTTING ROOM employs some 20 people who prepare a variety of custom cuts for roasts, steaks, stews, etc. Portions are packaged in transparent film, quick frozen, and stored for home delivery.

Food Plans Come Back Strong

Once labeled 'home freezer salesman,' today's food plan operator acts more like a food processor—and it's paying off. One example: Hager in Connecticut

EVER WONDER what happened to the food plan industry? From what was once a get-rich-quick scheme by freezer appliance salesmen, this marketing venture has given birth to a rapidly growing segment of the food processing industry.

According to a newly-released study by the Farmer Cooperative Service of the USDA, sales by frozen food locker and freezer provisioning firms amounted to $845 million in '59. Of this, some $550 million was gleaned from the sale of food—meat, poultry and commercial frozen items. This year's estimated freezer and food figure is put at $1.2 billion (about 2/3 food) out of a national food bill of $73 billion.

Over 1,400 food plans supply a variety of products to more than 3 million families. And the potential is even greater when you consider that about 13 million of today's families (1 in 4) are using home freezers.

The comparatively new food plans grew out of the locker provisioning industry which had its beginnings around the first part of the century. Lockers reached a peak of 11,600 in early '61 and then began to fall off to a still-declining figure of 8,965 in January '60. But, with the advent of the home freezer, the food plan took hold, initially in California.

Locker plants began performing the same service for home freezer owners that they had been accustomed to performing for locker patrons. Other enterprises, such as retail grocery stores, wholesale meat companies, frozen food distributors, and certain miscellaneous firms added facilities and equipment to serve the homemaker. And into prominence came a group called the independent freezer provisioners which were organized solely for home freezer service.

Today, 1,400 firms in the provisioning industry, nearly 1 in 10, offer no locker rental service at all but exist to cater to the needs of freezer owners. In many cases, these concerns operate their own prepared meat processing and freezing plants.

Varied Operation

While a decade ago the typical frozen food locker plant derived nearly all its revenue from custom storing and processing, today the average firm operates a growing merchandising program, handles many times the dollar volume of business, and is involved with developing effective sales programs, financing inventories, and providing consumer credit. And, significantly, most of the progress is occurring in big cities where the competitive market among chains and brands is already intense.

Growth of the food plans was knocked for a loop by shady practices shortly after its introduction in the late '40's and early '50's. Racketeers and fast-buck schemers used hard-sell techniques and fine print contracts to woo unwary housewives into joining. After joining, a family often found itself with much less than good quality food, good service, or any of the other original guarantees. The entire industry was given a woeful blackeye because of the unscrupulous tactics of some.

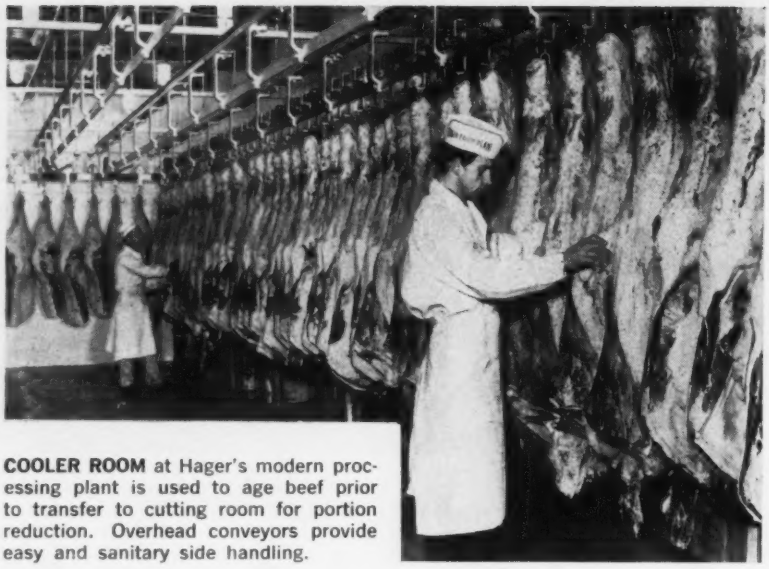
However, some of the more far-sighted entrepreneurs maintained quality and held their own. With a theme of top quality and service, many firms quietly and persistently built themselves into the food business, not just the freezer business.

Typical of those who prospered through ethical operation is Fred Hager, president and founder of a

JACK L. MISCHOU
Assistant Editor, "FOOD Engineering"

thriving food plan operation headquartered in Fairfield, Conn., which serves that state and parts of New York, Massachusetts, and Rhode Island.

A native of Switzerland, he came to this country some 15 years ago and eventually entered the industry as a freezer and provisioning firm salesman in New York City. After watching nearly 400 plans go out of business because of unstable operations and often unethical practices, he took his savings of $1,000, bought a trailer, and began the Connecticut operation. This month, Hager expects to top off a year's sales of some $4 million via one of the country's largest food plan operations. Of this total, more than half will be food sales.



COOLER ROOM at Hager's modern processing plant is used to age beef prior to transfer to cutting room for portion reduction. Overhead conveyors provide easy and sanitary side handling.

The Hager Plan

Hager's business actually comprises three areas: Sale of home freezers; sale of frozen and cold-stored foods to freezer owners; and financing of time payments made by the purchasers for such freezers and foods. Latter operation is carried out through Hager's subsidiary, Fairfield Credit Corp.

Firm's success has been built on a top-notch sales program conducted by an extremely youthful sales force (oldest is 42). Though most sales are made to customers owning Hager freezers, firm also sells to owners that might have purchased freezers through other plans. Under the plan, customer first buys the freezer on a credit arrangement. A food order form is prepared by a sales representative and is not signed by a customer until delivery of food is made. Sales are on an order-by-order basis.

Cost of a freezer is higher than a customer might be charged by a regular appliance dealer. And firm has agreed not to supply food at a price any more favorable than could be obtained from other food suppliers. While quantity discounts might be provided on the first order and future very large orders, dollar savings fall behind quality, service, and convenience as reasons for joining the Hager plan. Inducements include free home delivery on orders over $100, availability of high quality foods, fewer trips to the supermarket and "impulse buying," personalized service, and both food and freezer guarantees.

Hager's main plant consists of a one-story building with a 10,000-sq. ft. floor area divided into a meat-cooler room, a cutting room, a quick freezer and a storage freezer. Last year, an addition to the building and $85,754 worth of equipment helped increase plant's capacity to a point where it can accommodate some $50,000 of retail food per week on a one-shift basis.

Process Route

Processing consists of reducing meat cuts from wholesalers and packers into retail cuts such as steaks, roasts, stews and ground meats. These are then vacuum-packaged in special freezer paper, quick frozen, stored, and prepared for delivery to the freezer owner. Other foods such as fruit juice concentrates, vegetables, pies, etc., all of which are top brand names, are received from wholesalers and stored frozen.

Cuts are stored in a 9,775-cu. ft. cooler prior to reduction. Ready frozen products are maintained in a 21,018-cu. ft. storage area at zero F. Quick-freezing room has a capacity of 3,750 cu. ft. and the cutting room covers 2,584 sq. ft.

Meat orders are conveyed in numbered baskets into the blast freezer and fruit and vegetable orders are made up in corresponding numbered baskets. Assembling of custom orders takes place on a conveyor each morning, each Hager truck transporting some 15 orders. Theme of top quality control of quality products is dominant throughout the Hager operation and is credited with its president as being the main reason for the whole operation's success.

Unfortunately, while men such as Hager have managed to prosper, there still remain an element of operators who rely on the old shady tactics and manage to extract excess sums from uninformed families. Currently, the FTC is investigating the advertising practices of certain firms not as yet named.

Promotion Planned

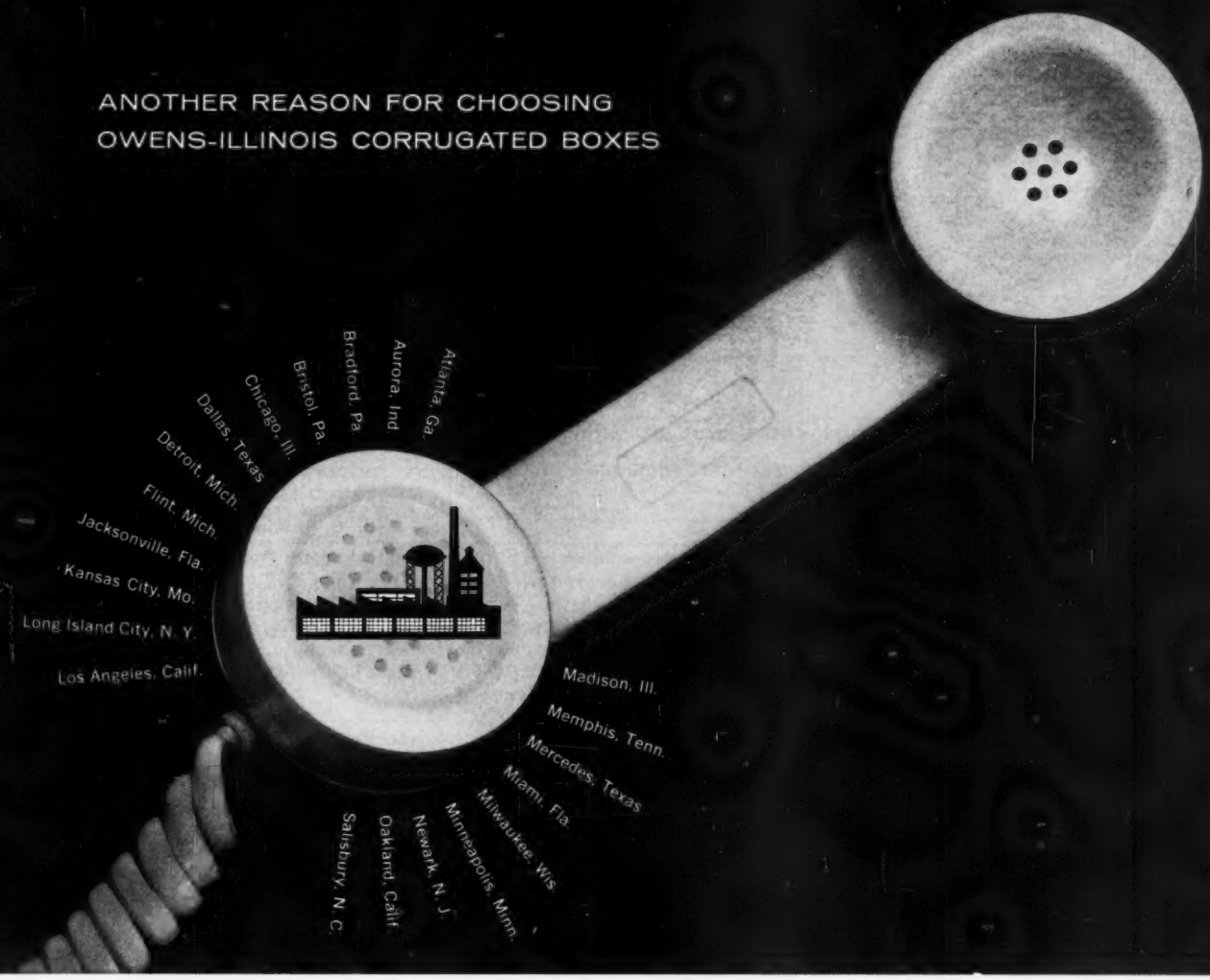
Making a significant attempt to police such illegitimate tactics as well as promote the food plan industry is the National Institute of Locker & Freezer Provisioners. Active since '55, this group of some 1,100 (65% operating food plans) has issued a code of ethics to Better Business Bureaus around the country and publicizes the proper questions for consumers to ask when considering a food plan.

Right now, the Institute is readying a sizable campaign labeled "The Silver Snowflake Story." Its purpose is to promote the use of provisioning plants and food plans throughout the country. Publicity, national advertising, certificates of guarantee, and other media communications techniques are planned via the Institute's program. And a national meat brand name for products sold by participating locker and freezer provisioners is being developed.

Despite the fringe elements still operating under misguided tactics, the future of food plans such as Hager's looks fairly good as a marketing technique and as a growing part of the food processing industry. (End)

CIRCLE 81 ON INQUIRY CARD →

ANOTHER REASON FOR CHOOSING
OWENS-ILLINOIS CORRUGATED BOXES



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LOCALIZED SERVICE FROM:

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Bradford, Pa.
Bristol, Pa.
Chicago, Ill.
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Detroit, Mich.
Flint, Mich.
Jacksonville, Fla.
Kansas City, Mo.
Long Island City, N. Y.
Los Angeles, Calif.*
Madison, Ill.
Memphis, Tenn.
Mercedes, Texas
Miami, Fla.
Milwaukee, Wis.
Minneapolis, Minn.
Newark, N. J.
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Salisbury, N. C.

*These plants are operated by National Container Corporation of California, subsidiary of Owens-Illinois.

Why not get in touch with the Owens-Illinois plant nearest you?

Whether you have a single or multi-plant operation, we are located to serve you. It takes only a telephone call to place our services at your disposal, whether you need a specific corrugated box design or general counsel on your shipping problem.

You see, Owens-Illinois *means* localized service . . . on a national scale. At every plant you'll find highly skilled design engineers, specialists in the field of corrugated boxes. We have no stock answers. Our approach is to best serve *your* needs.

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PART II—Tool Wear Charts

Here's How To...

...Curb Equipment Failure ...Cut Maintenance Costs

Control-chart procedure keeps product within "specs" accurately by predicting when to adjust process equipment. Technique applies to fillers, formers, slicers, etc.

OUTSTANDING among the many valuable statistical techniques for optimizing equipment maintenance and production control (FE Nov. '61, p. 39) is the use of Tool Wear Charts.

The method practically "tells" when to and when not to adjust processing equipment which shows gradual wear or drift. And it often gives advance warning of impending major repairs.

Example of drift or wear: Gradual clogging of valves on multihead volumetric fillers due to a slow product buildup. Another case is drift in net weights resulting from gradual change in product density. In such cases, net weight fills change slowly—downward in the first example and either up or down in the second case.

The same effects occur with other types of processing equipment, such as slicing and forming machines, depositors, and die extruders. In all cases, they can be controlled by the tool wear chart method.

Tool wear charts are sometimes referred to as "machine wear" charts. While they are control charts, they differ in several respects from the conventional type of SQC variable control chart. Tool wear chart techniques are usually applied by plant SQC personnel. In a small plant without an SQC department, the industrial engineer can be trained in this technique at university short courses, as well as with the aid of text books.

R. D. KORNBLUM, Operations Research Div., Armour & Co., Chicago

Charts help reduce: (1) off-quality (weight or product size) rejections, (2) production downtime by eliminating unnecessary adjustments, (3) routine equipment adjustment (done only when needed), and (4) maintenance costs.

Putting Charts to Work

Let's use the chart to control net weights on a 6-head volumetric bottle filler. Net weight is to be 64 oz., with specifications of 0.6 oz. above and below declared label weight.

"Spec" limits (Fig. 1) are represented as solid horizontal lines on upper "control chart for averages." Recorded here is average net weight of a 6-bottle sample selected at each inspection period. One sample is taken, in sequence, from each filler head.

The "range chart" below records net weight differences between highest and lowest weights of samples at each inspection period. It is used in conjunction with the average chart to detect causes of any "out-of-control" samples.

From a quality control standpoint, it is worth noting that we sample at fairly uniform time intervals. Other intervals are employed when more detailed information is desired. In our example, the process is machine controlled and relatively free of operator's influence on the characteristic (weight) being sampled.

However, where operator can influence production, safest recourse is to sample at random intervals. This avoids the possibility of operators anticipating quality control inspector's sampling time.

Again referring to Fig. 1, we can outline steps taken to use the chart technique for equipment with known gradual drifting effect:

...**1. Draw upper and lower specification limits** for net weights on the control chart for averages.

...**2. Find filler's normal net weight spreads.** A series of samples is taken at intervals during day's run, or over several days if time permits. Samples are always taken in groups of six—one bottle from each filler head in sequence. Average net weights are determined for each group.

Plant SQC engineer then uses statistical techniques to plot a net weight curve for 99.7% of the individual bottles. This curve, labeled "spread of individual bottles," is drawn to the right of control chart for averages (Fig. 1).

In our example, two curves for net-weight spread of individual bottles fit between upper and lower net-weight spec lines. This is necessary because the tool wear technique for drifting is applicable only when at least two of the spread curves for individual units produced fit within specifications for that characteristic. Otherwise, several remedies are available:

Overhaul the filler so that, with improved performance, spread curves for individual containers narrow and two or more fit within specifications. If the filler's operations can't be improved, another less desirable alternative is to increase the specifications, from ±0.6 to ±0.8 oz. for example. Or, the filler may be junked.

Control Charts for Averages

Each point on chart represents the average variation of 6 samples, one from each filler head in sequence.

FIG. 1. MACHINE WEAR CHART helps control filler performance by signaling gradual drift of net weights from pre-set limits. Construction and use of chart is detailed in article.

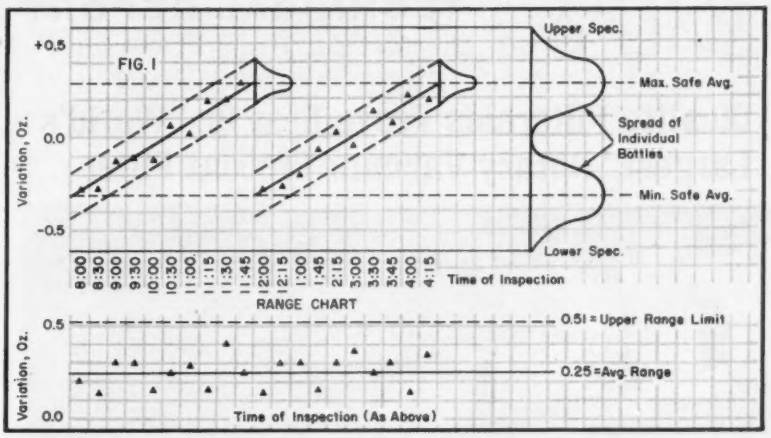
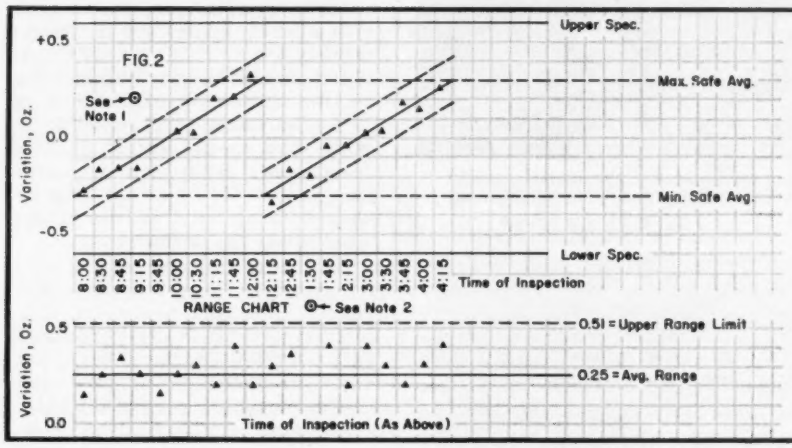


FIG. 2. OFF-TARGET WEIGHTS (circled dots on chart) are traceable to causes other than drifting—excessive product density and a foreign object that jammed a filler head.



Inspector's Comments

NOTE 1: All heads filling heavy, product too thick; processing notified & Temp. raised.

NOTE 2: Number 3 head jammed by foreign object; removed obstruction.

Product in 9:45 point passed but too heavy.

Product in 1:30 point rejected. 100 cases reworked as every 6th bottle was below specs.

...3. **Maximum and minimum safe net weight average lines** can now be determined by SQC methods. These limits coincide with the center of the upper and lower spread of individual weight curves. Mathematically, the safe average lines for individual bottles are three "standard deviations" from upper and lower specification limits.

Safe average lines mark the permissible high and low points for average net weights calculated for each sample group. If an average net weight point is outside these limits, it's time to adjust the filler.

The chart technique is particularly valuable in a gradual drifting operation, because it permits accurate prediction of when to reset the equipment.

...4. **Develop slanting control limits** for average net weights, which are unique to the drift-type situation. Again, the SQC engineer avails himself of statistics and, from several days of preliminary production sampling, constructs the particular sloping line of average net weights to be expected for this specific piece of equipment.

Parallel to this solid line, he draws sloping control limits for average weights (dotted lines in Fig. 1). These limits for averages (calculated by SQC methods) indicate the filler is operating normally if any average net weight point is within the area limits.

The curve at the end of each set of sloping control limits represents the spread of average net weights. Such average spreads are smaller than the spread for individual container net weights. If sample's average net weight point is outside the sloping dotted limits, an external cause other than the filler's drift is indicated.

A range limit is next determined and drawn on the lower range chart (Fig. 1). Range values (high minus low weight in sample) are used to spot causes of trouble.

Control Steps

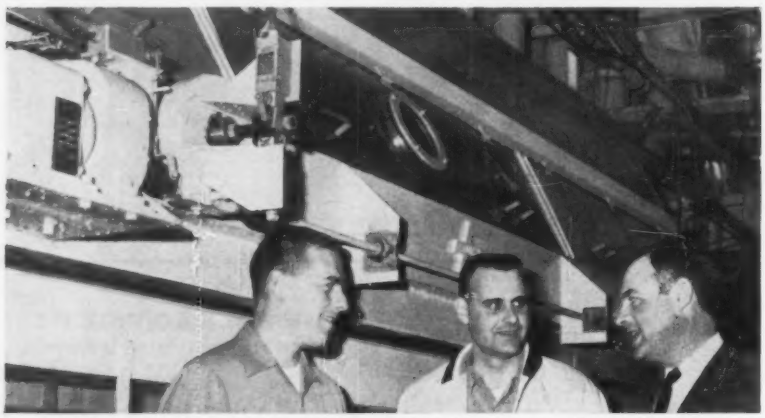
At start of a production run (8:00 A.M.), the calculated solid line for average net weight drift is drawn on the chart, starting up from the minimum safe average line. Calculations are revised whenever equipment has undergone a major overhaul or whenever indicated by sampling data signals.

Also charted are the calculated dotted sloping control limits. Filler is adjusted to give average weights of six consecutive samples falling within the area parallel to solid line and dotted limits at 8:00 A.M. point. Where the solid sloping line meets maximum safe average line, we anticipate need for re-setting the filler—approximately 11:45 A.M., according to Fig. 1.

(Turn page)

DICALITE®
TECHNICAL REPORT
DICALITE DEPARTMENT • GREAT LAKES CARBON CORPORATION • 612 SO. FLOWER ST., LOS ANGELES 17, CALIF.

Dicalite Filteraids Prove Best On "World's Largest" Rotary Vacuum Precoat Filter



Left to right: John Murch, vice-president and chief engineer, and general manager Bob Ashby, discuss the filter operation with Bob Barber, Dicalite service engineer.

In the A. F. Murch Company plant at Paw Paw, Michigan, the "world's largest" rotary vacuum precoat filter —an Eimco, 8 feet in diameter and 20 feet long—filters 5,000 gallons of fruit juice an hour through a 5-inch thick precoat of Dicalite filteraid. We are told that only 7 filters this size are in existence, and only this one in the fruit processing industry in this country.

This giant filter was chosen because Murch desired a filter cycle which matched the operating cycle of their evaporators. These operate continuously for 36 hours between cleanings.

Norm Roger, Murch director of research and quality control, works with Barber on filteraid evaluation for new strawberry product. Barber is using a Dicalite Rotary Vacuum Precoat Test Leaf.

The filter cycle length and the desired throughput were the basis for calculating both the size of the filter and the required thickness of the precoat.

Final filteraid evaluation tests extended over 6 months, during which Dicalite and other filteraids were checked for throughput, clarity, cake shrinkage and cracking. Two Dicalite filteraids were chosen—Dicalite 372 (diatomite) for grape juice, and Dicalite 476 (perlite) for apple juice, which requires a higher polishing. A new Dicalite perlite filteraid, 4156, has also been tested and is scheduled for use.

A major factor in the selection of Dicalite perlite filteraids was their lighter weight—20% less than comparable filteraids of other types—which permitted the buildup of required cake thickness. Even so, the 5″ thick precoat takes over 1½ tons of filteraid, dry weight, which rises to between 4 and 5 tons when wet.

Murch processes nearly 4 million gallons a year of grape juice, apple and cherry juice into high density concentrates and volatile esters and is now testing Dicalite filteraids for use in a new strawberry product.

Write for literature.
Dicalite Department,
612 South Flower Street,
Los Angeles 17, California.

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Therefore, at 11:45 A.M., filler is re-set so that average net weights are within the dotted control band (as at 8:00 A.M.) at the lower end of a new sloping solid line drawn as before. Again note in Fig. 1 that another re-setting of the filler is indicated at 4:15 P.M.

To simplify chart maintenance when production starts each day at a definite time, sloping average control lines can be drawn in advance on many charts. Note (Fig. 1) that intervals between samplings are reduced before and after re-settings.

However, it should be pointed out that SQC methods are also employed where production is interrupted.

Extra Benefit

Finally, tool wear charts provide a benefit aside from the maintenance advantages outlined. When an average net weight falls outside of control limits, there is 99% assurance that something other than normal weight drift is responsible. Same principle holds for ranges of a sample group's weight being outside the calculated upper range limit.

Illustrated in Fig. 2 is this quality control "plus" of tool-wear charts. On this particular day, filler re-settings were performed as prescribed by the chart. But note the detection of two real causes of quality control difficulty other than drift. They're indicated by an out-of-control limit average net weight at 9:15 A.M. and an out-of-control limit range point at 1:30 P.M.

SQC methods using average and range charts inform the inspector that the 9:15 A.M. out-of-control high weight point is due to a cause common to all six filling heads. It was traced to a product that was too dense. Condition was easily corrected by adjusting processing temperatures.

The 1:30 P.M. out-of-range control point was checked out by SQC inspector as something traceable to one or two of the six filler heads. It turned out that No. 3 filler head was jammed by a foreign object.

In this case, every sixth bottle was short weight. The individual out - of - specification situation points up the sensitivity of the average and range chart combination. This situation necessitated rejection and detailed inspection (to eliminate short-weights) of products filled between previous check time and 1:30 P.M. (End)

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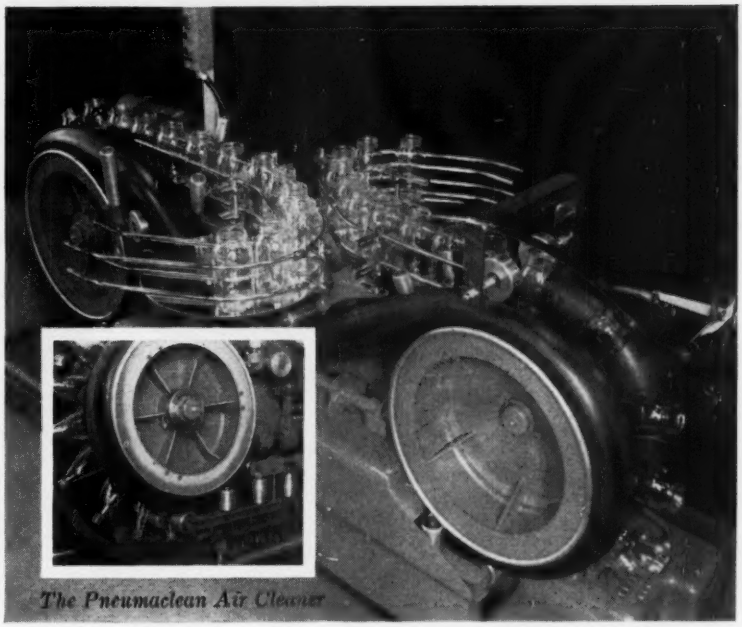

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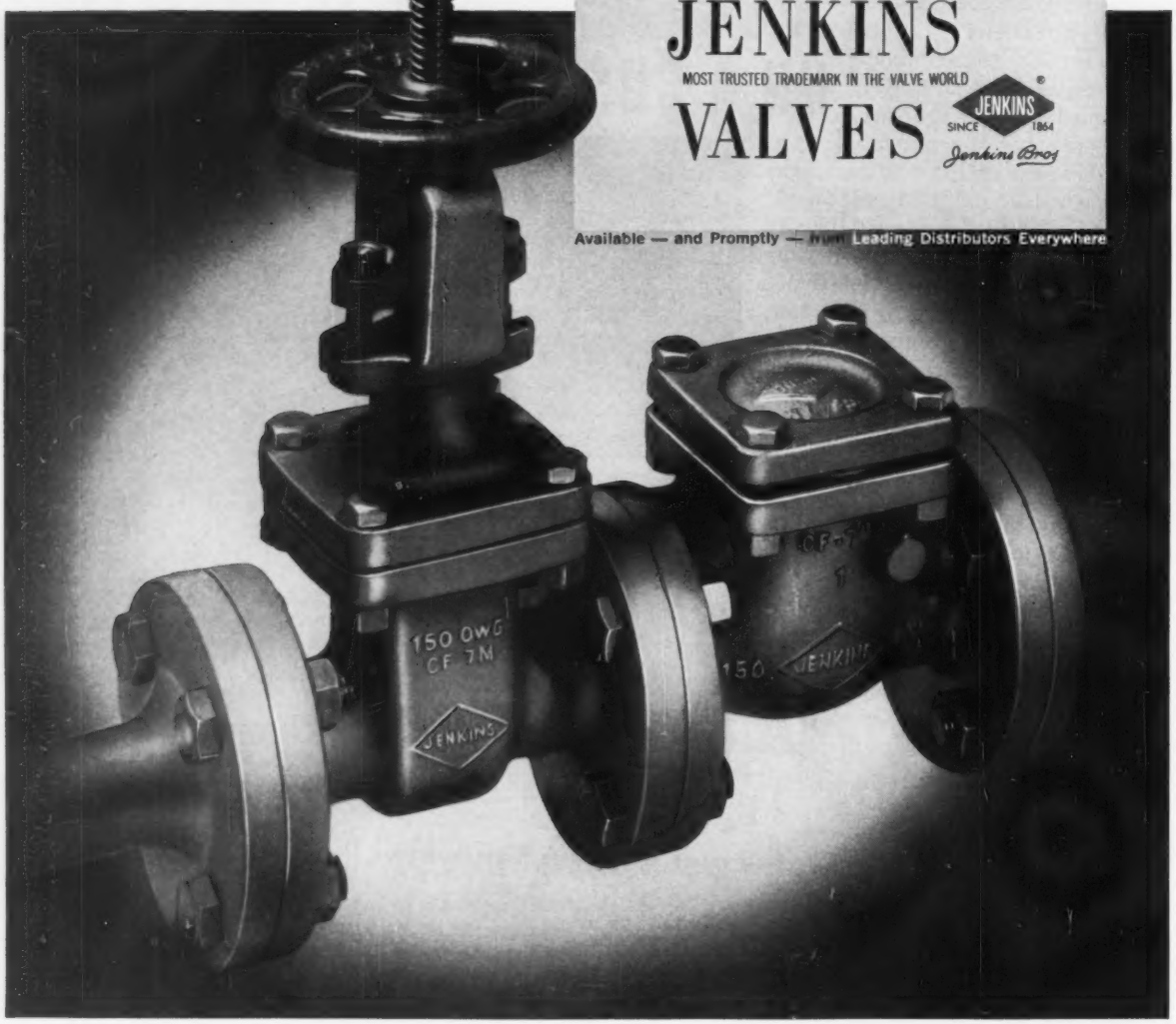


Advances in Technology

Hydraulic Pressure Method Determines Free Moisture Content of Cooked Meat

A simplified hydraulic pressure technique has been developed for determining the free moisture content of ground cooked lean meat. Method requires only 1.5-g. samples and only a few minutes for each assay. The following factors were evaluated for their effect in the determination:

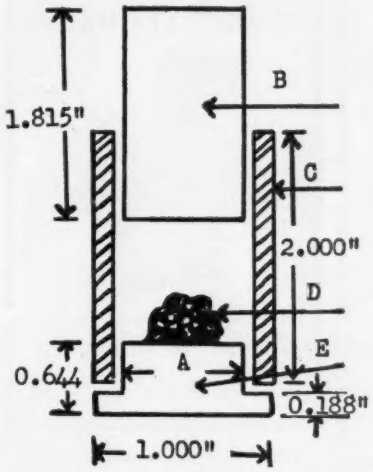
Sample weight. Free moisture values are consistent when the sample range is 1.5-3.0 g., therefore 1.5-g. weights are adequate.

Pressing time. Varying the length of pressing time at 500 psi on 1.5-g. samples indicates that the free moisture content is independent of press time after 1 min.

Varying pressure. On 1.5-g. samples after 2 min. at 300, 400, 500, or 600 psi, results show no significant difference in varying the pressure. A 500-psi pressure is adequate.

Heating time, raw meat. Cooking times were varied from 10-25 min. Drip losses were determined of raw meat samples immediately after heating as were free moisture contents of cooked samples. Results indicate very little variation in either drip losses or free moisture contents from varied cooking time.

Adding ficin and/or salts. Proteolytic enzymes (ficin) and salts (NaCl, $Na_5P_3O_{10}$) affect the water-binding capacity of proteins. The free moisture content was determined of meat cooked after addition of ficin and/or the above salts



PRESS CELL used in the hydraulic pressure method. Cross section shows: (B) stainless steel piston, dia. 0.778 in.; (C) brass tube, 0.110-in. wall thickness, 0.780-in. ID; (D) meat sample; and, (E) stainless steel platform, dia. at (A) is 0.778 in.

by this press cell method. With ficin-treated meat there was a small reduction in drip losses, but correspondingly higher free moisture values. Salt treatment caused a large reduction in drip losses during cooking. Salt-treated samples were "rubbery" in texture after cooking, but samples containing both ficin and salts had a normal texture. — *Food Technology,* 392-394, Sept. 1961.

Freezing Meats During Irradiation Protects Flavor

Freezing of meats during irradiation by a beam of electrons has been found to give considerable protection against the flavor changes that irradiation induces in meats.

Temperatures down to —75C. were used, with irradiation doses of 1, 2, 3 and 4.5 Mrads from the scanned beam of a Van de Graaff generator. (2 MeV). There was little protection of the meats in the temperature range 0 to +20C. The region between 0 deg. and —20C. was the optimum range and there was very little improvement at lower temperatures.

Destruction of glutathione is a convenient chemical measure of the damage that occurs during irradiation. Measurement of it gives more precise results than estimation of quality changes by a taste panel. Using the destruction of glutathione as an index it was found that an important part of the protection of beef and pork is due to freezing of the free water in the tissue.

Microorganisms in minced beef and pork are also protected against irradiation by freezing; the numbers of bacteria surviving irradiation rises sharply as soon as the temperature during irradiation drops to 0C.—*Jour. of the Science of Food & Agric.,* 483-490, June, 1961.

More Factors Evaluated in Fat Bloom of Chocolate

In an exhaustive review of chocolate fat bloom, it is shown that careful adjustment of the temperatures of centers and molds to that of the coating is important.

Of 19 additives tried only butter fat, hardened peanut oil, and "Bisuitine" fat partly delayed or prevented bloom but only under very definite conditions. Addition of Span 60, Tween 60, and glyceryl monostearate were ineffective. Fractionated cocoa butter not only failed to prevent bloom, it accelerated its formation.

Bloom formation is closely correlated with iodine value, increasing with decreasing iodine number. Warm storage tempering of finished goods is a very effective way of delaying or preventing bloom, but the effect on the centers must be considered.

Infra-red radiation directed specifically at the coating of the chocolates is very successful. It need be applied for only a short time in a section of the production line so that even very sensitive centers are not changed in appearance or taste. Samples so treated and stored for two years at 68-72F. remained stable and free from bloom.—*International Choc. Review,* 16, No. 5, 201-219, May 1961.

Organism Causes Violet Color in Cream and Milk

In an outbreak of violet discoloration of market cream and occasionally milk, the causative agent was shown to be *Chromabacterium lividum.* The discoloration varied from a scarcely noticeable shade to a deep intense violet in older milk and cream, and usually occurred in products held at 34-50F.

The organism responsible for the discoloration is a Gram-negative rod that produces viscid colonies

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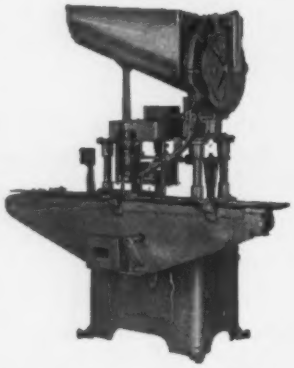

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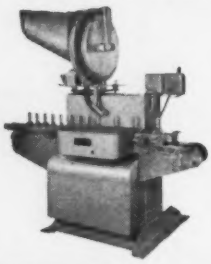

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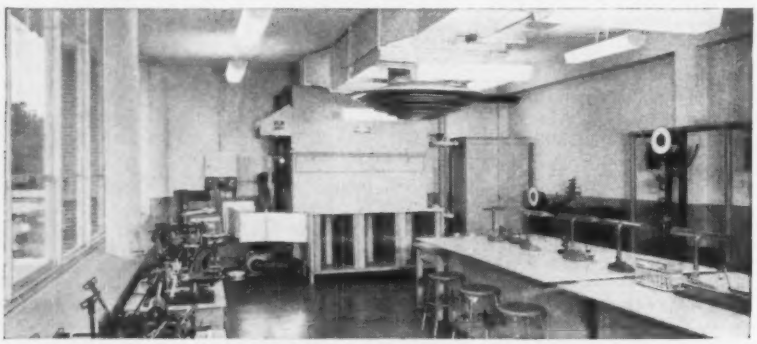

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Advances in Technology

with abundant violet pigment on tryptone glucose yeast extract agar at 4C., but no growth at 37C.

It probably originated in the soil of the farms where the milk was produced, or it may have been a water-borne contaminant. It was easily destroyed by exposure to 56C. (132F.) for 5 min. which suggests that the infection of the milk and cream was postpasteurization. — *Applied Microbiology*, 9, No. 4, 287-290, July 1961.

Organic Acids Identified in Barley Grain

Since organic acids may play significant roles in germination and seed metabolism, their identity and amounts in whole barley grain and fractions were investigated.

An improved procedure of partition chromatography on silica gel was developed to separate and determine the acids. Paper chromatography was used to identify individual acids and to make preliminary qualitative studies of the acids in alcohol extract. Further, efficiency of ion-exchange adsorption as a means of isolating acids from extracts was compared to ether extraction.

Identified organic acids were: Malic, acetic, succinic, fumaric, malonic, alpha-ketoglutaric, lactic, citric, aconitic, and pyrrolidone carboxylic. Presence of phenolic acids was confirmed: Ferulic, vanillic, *p*-hydroxybenzoic, and *p*-coumaric. —*Cereal Chemistry*, 407-422, Sept. 1961.

Source of Bitter Flavor in Cheese Postulated

Cell-free extracts from two single strain cheese starter cultures were incubated with sodium caseinate for comparison of proteolytic activity.

Increase in the acid soluble nitrogen was practically the same for both cultures. But the increase in amino N was greater for one strain, previously reported as "non-bitter," than for the other strain, previously associated with bitter flavor in cheese.

This lends further support to the view that bitter flavor in cheese could result from insufficient degradation of polypeptides to amino acids.—*Australian Jour. of Dairy Technology*, 96-98, April-June 1961.

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And no wonder he feels that way
The foods and the cheeses that fill his bowl
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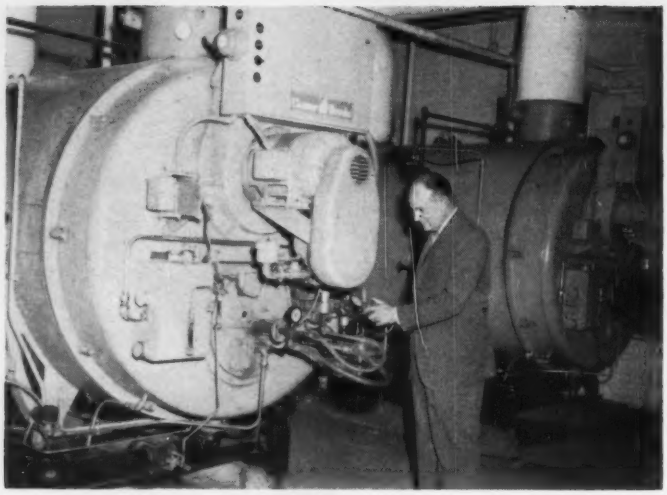


PACKAGED BOILERS are cross-linked so that one kicks on if other fails. Units are equipped with automatic controls for efficient performance, and design features for greater fuel economy.

Trouble-Free Boiler Service . . .

. . . is possible with packaged boilers and planned maintenance. It pays off in long-term savings, lower operating and maintenance costs—and longer boiler life

WOULD YOU BE SO BOLD as to take a $4,000 loss by ripping out two already-installed shells for built-up stationary boilers while you're constructing a new plant? You would, provided your immediate and long-term savings as well as other benefits justified such a daring move.

National Baking Co's. (Chicago) chief engineer Minos Asproyer-akas did just this when he joined the firm while its new $3¼-million bakery was under construction. He replaced these shells with factory-preassembled "packaged" boilers (Cleaver-Brooks). From past experience, he knew that packaged boilers would mean substantial savings from a standpoint of installation, performance and maintenance.

IMMEDIATE SAVINGS. Despite the initial $4,000 loss, National realized an immediate savings of $8,000 on installation of a pair of 200-hp., fire-tube packaged boilers. For these boilers come as completely assembled units, with quoted price including all standard components. No on-the-job assembling costs were added onto the base price.

Broken down, these savings amount to:

► **$3,000 on purchase of new boilers** — a saving representing the difference in cost of packaged and built-up stationary boilers.

► **$2,000 for insulation.** National Baking estimates insulation alone would have cost $1,000 for each boiler constructed on the job site. Packaged boilers come insulated, with neat appearing protective steel sheeting covering insulation. Factory-fabricated sheeting abolishes periodic painting — a job that's frequently necessary with painted, fabric-type coverings installed on built-up boilers.

► **$2,000 in labor and piping** that would have gone into the installation of remotely located fuel oil-preheating equipment. Packaged boilers have their own pre-installed preheating equipment.

► **$1,000 on electrical wiring and pretesting.** Unlike built-up stationary units, packaged boilers come completely pre-wired and factory tested. They are simply hooked up to power lines, don't take weeks of testing before they're put into operation.

LONG-TERM SAVINGS. Here's how these are effected:

► **Through automatic controls.** National works three shifts, seven times a week, with only a 4-hr. break on Saturdays. And since it's so dependent upon steam, the packaged boilers operate 24 hr./day the year round. The boilers are operating on low-pressure so they don't require constant attention of the operator. Also, with automatic controls on the boilers, the operator is free to perform other duties as well.

Combustion control-systems program operating sequence of blower, burner motor, ignition, fuel valves and modulating motor. In operation, a pressure drop operates the boiler blower, through a pressure controller and combustion safeguard. Following a pre-established purging time (30 sec.), pilot comes on. And when pilot flame is established and photoelectrically detected, then either a fuel solenoid or electrically-operated motorized gas valve opens. After main flame is established, pilot goes off. Then, the main flame is photoelectrically detected during

JOHN V. ZIEMBA, Senior Associate Editor, "Food Engineering," Chicago

burning cycle. In event of flame failure, electronics combustion safeguard shuts boiler down.

As a safeguard, boilers are cross-linked in parallel, preset at different pressures. In event one boiler fails, pressure drops to presetting of other boiler which automatically kicks on.

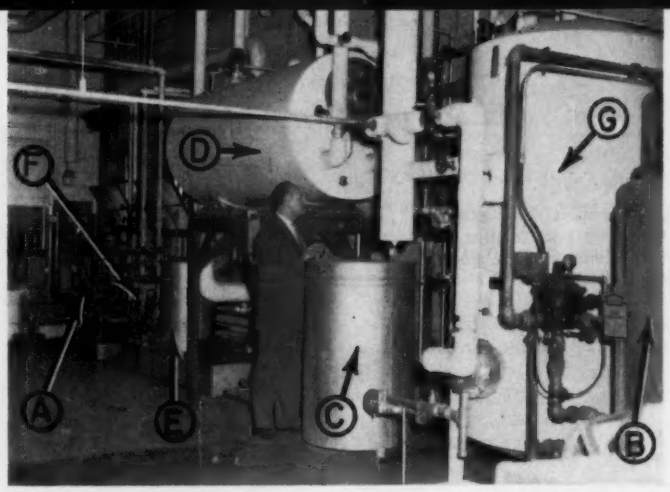
In addition to start-stop pressure controller operating on predetermined setting, a potentiometer is used to modulate air damper. At the same time, this instrument (through mechanical linkage) proportions the amount of gas or oil fuel to provide proper fuel-oil ratios at all times. This way, the potentiometer permits efficient operation of boiler for any given work load, eliminates too high and too low performance peaks.

Other controls start-stop water feed pump that maintains proper water level in boiler, stop firing if water level drops too low. Make-up water is softened to prevent build-up of scale in boiler. Employed is a zeolite ion-exchange unit, from which softened water is delivered to a steam-injector type deaerator (to remove oxygen-causing boiler corrosion). Boiler is supplied through a centrifugal pump each time water level drops below setting.

Every time this water feed pump is activated, a chemical metering pump supplies a predetermined amount of anti-corrosion chemical solution, signals solenoid valve that opens blowdown line. (Even when chemically treated, boiler water still contains impurities that cause priming or foaming. And, if too concentrated, these impurities are often carried out with steam to impair efficiency of steam-using equipment and facilities.)

To remove these impurities, periodic blowdowns are carried out manually and automatically. Installed, in the first case, is a manually operated meter valve (beyond solenoid) for conducting blow downs at irregular intervals. Amount of manually-operated blowdown is varied in accordance with everyday boiler water-treatment tests.

Since manual blowdown can't be related to variations in steam loads and concentration of water impurities, National's automatic system regulates blowdown in accordance with load variations. Blowdown is controlled by specific conductivity reading made by a Solu-Bridge unit. System also contains a heat-exchanger for transferring blowdown water's heat to incoming feed water, thereby achieving substantial savings in fuel costs.



MAINTENANCE COSTS are slashed through use of fuel oil-preheating system hooked up to oil circulating pumps (A) and boiler water-treatment system comprising zeolite water softener (B), regenerating salt tank (C), deaerator (D), chemical feeder (E) and water feed pump (F). Also shown is hot water tank (G).

Zeolite's ion-exchange cycle is also automatically regulated through a water meter. After passage of a predetermined amount of water through meter, regenerating cycle is activated. And, in the same way, system reverts to water-softening cycle.

► **Through fuel.** Fuel savings obtained with an efficient boiler quickly makes up for any difference likely in initial purchase costs. In fact, Asproyerakas learned in a previous instance, that **a modern replacement boiler paid for itself in just a few years. Reason was that savings accumulated as a result of better fuel efficiency (ratio of usable to potential heat), using more economical fuel oil, fewer boiler breakdowns and product losses.**

Fuel efficiency of National's new Cleaver-Brooks boilers is a minimum 80% (guaranteed). And this covers the full range of operating loads—from 30-100% of boiler rating.

High efficiency of National's new boilers stems primarily from a burner that proportions just the right amount of air and fuel. But, in addition, there are several basic boiler designs that contribute to the high fuel-to-steam efficiency. These are:

. . . **Four-pass system (for extraction of heat from combustion gas).** Here, size of burner tubes are reduced in each successive pass to maintain high gas velocity required for efficient heat transfer. This high velocity produces a "scrubbing action" that draws maximum heat out of fuel.

. . . **Ratio of 5 sq. ft. of heating surface per boiler horsepower.** Cleaver-Brooks claims this is the greatest amount offered in any packaged boiler. In addition to improving heat transfer, this feature adds to boiler's life. Boilers with less heating surface tend to corrode and build up scale faster, inasmuch as they have to "work harder" to produce the same amount of steam.

. . . **Forced draft fan.** It supplies air for combustion at uniform temperature and pressure to assure proper air-fuel ratio and high combustion efficiency.

. . . **Low furnace design.** Chamber containing hot combustion gases lies within boiler water to reduce foaming action and produce drier steam.

National's boilers operate on either gas or oil (Bunker C), and switch quickly from one to the other. Gas is available during summer months, and heavy oil is used in winter.

When the decision to purchase the two packaged boilers was made, Asproyerakas first wanted assurance that the heavier, more economical (than lighter oils) Bunker C could, with pre-heating, be employed. He was fully satisfied when he and his oil supplier participated in a performance test at the Cleaver-Brooks' plant — where National's two boilers were awaiting shipment.

At the bakery installation, boilers are equipped to atomize the heavy oil. In this way, the oil is broken up into tiny droplets that burn much like gas. (Fuel efficiency improves as droplets get smaller—more surface exposed to air.) (Turn to p. 93, col. 3)

CO-AUTHOR KONDRUP examines the body and texture of a typical sample of good Dagano cheese.

Introducing Dagano Cheese

Pleasing nutty flavor and short ripening time are prime characteristics. New Swiss type cheese is easy to make

A NEW SWISS TYPE of cheese called Dagano is just being introduced. Its pleasing nutty flavor and short ripening time have created a great interest. Consumers have responded enthusiastically to this new cheese in the limited trials which have been conducted.

The principal advantages of Dagano cheese are: (1) its flavor appeal, (2) good slicing property at refrigerator temperatures, (3) rapid curing, (4) excellent keeping quality, and (5) high yield.

How It's Manufactured

Dagano cheese is not difficult to make. However, two precautions are important—good quality milk and the correct starter. Also, contamination with coliform organisms must be held to a minimum.

Milk should be standardized or blended to 3.1% milk fat. Pasteurization temperature and time should be kept to a minimum.

The special starter used for Dagano cheese consists of a mixture of **Streptococcus lactis, S. diacetilactis,** and **S. cremoris** comprising approximately 90%, and **Betacoccus cremoris** the remaining 10%.

Only 0.5% special starter based on milk weight is used for setting. Approximately half (0.25%) is added when the milk starts to flow into the cheese vat. The remainder (0.25%) of the starter is added just before the addition of rennet but not later than one-half to three-quarters of an hour after the first addition of starter. The setting temperature is 85F. Rennet (diluted in water) is added at the rate of 12 ml./100 lb. of milk.

About 30-35 min. after setting, the curd is cut into ¼-in. cubes and after a hold of 5 min. gentle agitation is applied. One-third of the whey is then drained off and agitation resumed for 5 min. Cooking is started very slowly by applying heat to the water in the jacket and by sprinkling water at 170-180F. into the vat with the curd. About 15-20% of the water on the basis of the milk is added. Cooking takes 25-30 min. with the maximum temperature maintained at 100F.

The next step consists of pushing the cheese cubes to the end of the vat (opposite end from the drain). The curd should be leveled to about 12 in. deep. Cheese cloth is placed over the curd and is covered with a press plate. Sufficient whey is maintained to just cover the curd. The whey will aid in keeping the curd warm and will tend to exclude air exposure. During the first 5 min., weight on the press plate is 1 lb. for each 4 lb. of cheese; for the next 15 min., the weight is increased to 1 lb. for each pound of cheese.

The whey is drained and the curd is cut into blocks that approximately fit the hoops (20-pound Wilson type block). These are placed in the press and given 10 lb. of pressure for 1.5 hr. Wrinkles in the cheese cloth are removed and the cheese is pressed again at 20 lb. pressure for 2 hr. more. After removal from press, the cheese blocks are submerged in cold water (45F.) for 2 hr. Submersion overnight may be necessary if the water temperature is above 45F.

Next the dagano cheese is placed in a brine tank having a salt concentration of 21 deg. Baume and temperature of 54F. Salting is complete after 48 hr. in the brine. The surface is dried by placing the cheese in a room at 54F. and low humidity. A fan will reduce the drying time to a couple of hours.

E. KONDRUP and T. I. HEDRICK
Dairy Plant, Dept. of Food Science, Michigan State University

Coating for curing can be a wax or a suitable film material. In the M. S. U. Dairy Plant the preferred system is to vacuum package each block in a cryovac bag. Twelve inches of vacuum for a 5-sec. exposure has been satisfactory. Bags are tightly closed with a metal clip. Shrinkage of the film is accomplished by submersion for 2 sec. in water held at boiling point.

Curing & Characteristics

The cheese is placed on shelves in the curing room held at 68F. If the cheese is inverted every third day for the first 2 weeks, and then once weekly, the eye formation usually will be satisfactory. About 4 to 5 weeks of curing will develop sufficient flavor. Dagano cheese can be stored for as long as 2 yr. if held under suitable conditions at 32-34F.

Desirable characteristics include a semi-soft, pliable body and smooth texture. A cross section cut of 4 x 12 in. should show approximately 15 to 17 natural eye holes in the range of 6-16 mm. dia. With the exception of the eyes the body should be compact. It has excellent slicing qualities at home refrigerator temperatures.

A mild to medium nutty flavor is considered to have optimum appeal. Other flavors are atypical and an indication of contamination, improper manufacture or curing. The suggested composition control is not less than 45% milk fat (dry basis) and not more than 46% moisture. The usual range is 43-44% moisture.

Consumer Reaction Favorable

Results of various studies on consumer reaction to Dagano cheese have been very encouraging. Some 95% of a statistically selected panel of supermarket customers (118 adults) in the Detroit area expressed good acceptance of Dagano. Many were enthusiastic.

Customer purchases of Dagano cheese in the M. S. U. Dairy Store have increased consistently since introduction six months ago. Without benefit of any advertising, even in the store, sales have climbed to second place (Cheddar was first) among nine other common representative varieties.

Attendees at several cheese festivals were given a freedom of selection among numerous varieties. The amount of Dagano cheese consumed on-the-spot was equal to or greater than any of the other varieties. (End)

LA PORTE

FLEXIBLE STEEL CONVEYOR BELTS

. . . CUT COSTS ON STATIONARY AND PORTABLE CONVEYORS

In the plant, on the receiving platform, on the shipping dock or in the field, La Porte Flexible Steel Conveyor Belts give long, economical service with minimum maintenance.

Their rugged steel construction and open-mesh design make them readily adaptable to a wide range of processing operations in wet, dry or frozen packs, and facilitate sterilizing with steam gun while belt is in motion. Flexible open-mesh feature also assures a positive drive on the La Porte Sprocket and prevents raw or processed food from rolling off. Besides, La Porte Belts provide a perfectly flat surface for containers, empty or filled.

If you process, package, store or ship food, it will pay you to use LaPorte Belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

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La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Boiler Service (Cont.)

But the degree of atomization is influenced by the fuel's fluidity or viscosity. And it's the job of the preheaters to make the oil less viscous. That's why burner's operating cycle can't be started until the preheaters bring the oil to a temperature that insures proper ignition and efficient combustion —a job that's designed for automatic performance.

► **Through maintenance.** National Baking inspects and cleans its boilers' tubes only once a year instead of once or twice a month. This is attributed to the "self-cleaning" action traceable to boilers' superior fuel efficiency and high gas velocity (while making four passes).

Boilers' fuel-atomizing nozzles don't have to be cleaned more than once a year because each unit is equipped with a solenoid valve that's electrically interlocked with a fuel-supply solenoid. With this hook-up, air solenoid opens to purge nozzles when, at the end of the burning cycle, the oil-solenoid closes.

Cleaning of the tubes is simplified through use of hinged front and rear doors so that, with removal of a few bolts, tubes and furnace can be quickly exposed for inspection. Doors are sealed with preformed asbestos gaskets. HOW STEAM'S USED. National relies heavily upon efficient, uninterrupted operation of its boilers in order to fulfill heavy daily requirements of its Chicagoland institutional and chain store-customer trades for breads, hard rolls, soft buns and brown-'n-serve rolls.

It employs boiler-generated steam for:

. . . **Putting a crust on rolls traveling through baking ovens.** These ovens are equipped with pipes that periodically release steam (to maintain desired humidity).

. . . **Raising doughs in proof boxes,** where temperatures are maintained at 95F.

. . . **Fermenting doughs.** In fermentation room, water is atomized with outside air fan-pulled into spraying system. As humidity drops, steam cuts in to maintain 84-F. dry and 80-F. wet bulb conditions.

. . . **Steam-kettle cooking.** National bakes some sweet rolls, too.

. . . **Pan and rack washing** as well as using domestic hot water.

. . . **Steam cleaning** their processing equipment. (End)

Men & Companies

E. W. Rawlings

C. H. Bell

GM Ups Two . . . E. W. Rawlings, General Mills executive v.-p. since April '60, has been named company president. C. H. Bell, president since '52, will succeed Gerald S. Kennedy as board chairman. Mr. Kennedy will continue as chairman of the board's executive committee.

Mr. Rawlings joined GM in '59 upon retirement as a four star general of the U. S. Air Force where he headed the Air Materiel Command for eight years. Elected to the board, he was also appointed financial v.-p., with responsibility for broad financial planning of the company. In April '60 he was named executive v.-p., heading finance and consumer food activities. In June '61 he became executive v.-p. for all operations and finance.

Newly elected chairman C. H. Bell, son of the late James F. Bell, founder of General Mills, joined the company in '30. In '34 he became a grocery products salesman and in '37 sales promotion manager for grocery products. He was later appointed research-production coordinator and in '47 elected a v.-p. He became executive v.-p. in '50 and president two years later. Mr. Bell has been a board member since '48.

James D. North

Charles Overbeck

New GF Chiefs . . . James D. North and Charles Overbeck have been named v.-p.'s of General Foods Corp. Mr. North will function as marketing services v.-p. and Mr. Overbeck assumes the newly-created post of research and technology v.-p.

Mr. North joined GF in '37 and since then has held responsible sales, advertising, and marketing positions with Jell-O, Post, and Birds Eye Divisions, and had been a corporate marketing counselor prior to his election as v.-p.

Mr. Overbeck came to GF in '44 and has held a succession of increasingly important engineering, production, and operations managerial posts in the Maxwell House, and Jell-O Divisions.

Three other key executive promotions have also been announced at GF. E. F. Fitzmaurice, corporation v.-p. and general manager of the Perkins—S.O.S. Div., is now development v.-p. M. R. Bohm, marketing manager of the division, succeeds Mr. Fitzmaurice as general manager.

Mr. Martin Gregory succeeds Mr. Overbeck as group manager—operations, and will be responsible for the Atlantic Gelatin, Carton & Container, and Electri-Cooker Divisions, as well as California Vegetable Concentrates, a GF subsidiary.

Personnel

John F. Schaible, president of Schaible Baking Co., Easton, Pa., has been elected president of Quality Bakers of America Co-op.

John L. Bate takes over as president of Pepsi-Cola Metropolitan Bottling Co.

A. W. Dutcher, former production v.-p. of Dulany Foods Inc., moves up to executive v.-p. post.

Thomas Manglis, Shenandoah Pie Co., St. Louis, becomes chairman of the Wholesale Pie Branch of the American Bakers Assn.

Adolf A. Berle moves up to board chairmanship of American Molasses Co.

Erik E. Roos takes over as manufacturing v.-p. of Rival Packing Co., Chicago, a division of Associated Products Inc.

Lyman D. McKee has been renamed president of Dairy Society International.

Frederick Sheffield has been named to the board of American Sugar Refining Co.

John N. Walker, secretary-treasurer of Mt. Olive Pickle Co., Mount Olive, N. C., has been elected president of National Pickle Packers Assn.

Vernon Stouffer, president and a founder of Stouffer Foods Corp., has been named "Man of the Year" by the Frozen Food Assn. of Delaware Valley.

Frank Armour Jr., president of H. J. Heinz Co., is one of seven executives named to head newly-formed steering committee of the Brand Names Foundation.

Harold A. Shaub, v.-p. and general manager of Campbell Soup Co. Ltd., has been elected to the board. **Archibald E. Burt** takes over as corporate relations v.-p.

John F. Nolden moves up to product manager for "Tang Instant Breakfast Drink" and "Instant Postum" in Post Div. of General Foods.

H. F. Marston has been named v.-p. and general manager of Western Div. of Kraft Foods, Div. of Nat'l Dairy Products Corp.

Industry

National Food Conference is beginning its third Youthpower Program for the purpose of increasing public understanding, appreciation, and response for the total food industry and its products.

St. Joseph's College, Philadelphia, plans construction of a new Academy of Food Marketing which will also serve as a national research and reference center for the food industry.

V. La Rosa & Sons Inc. has added an entire line of Italian style cookies, breadsticks, and biscuits to be marketed nationally. Firm has obtained a major interest in **Star Crest Baking Co.,** Woodside, N. Y. and will operate it as a division for production of new product line.

Procter & Gamble's Food Products Div. has established an industrial food products sales div. consisting of a bakery, restaurant, and institutional food sales dept., and a bulk fats and oils sales dept.

Associated Industries

H. Kohnstamm & Co. Inc. has elected J. Sinclair Armstrong, executive v.-p. of U. S. Trust Co., a director of the company.

Milprint's Dom A. Perino, Development Div. manager, received Packaging Institute's Technical Operations Planning Board Award for his paper "Expanding the Polyethylene Extrusion-Coating Art."

American Can Co. has appointed Delmont J. Lohuis R&D manager for Milk Container Div.

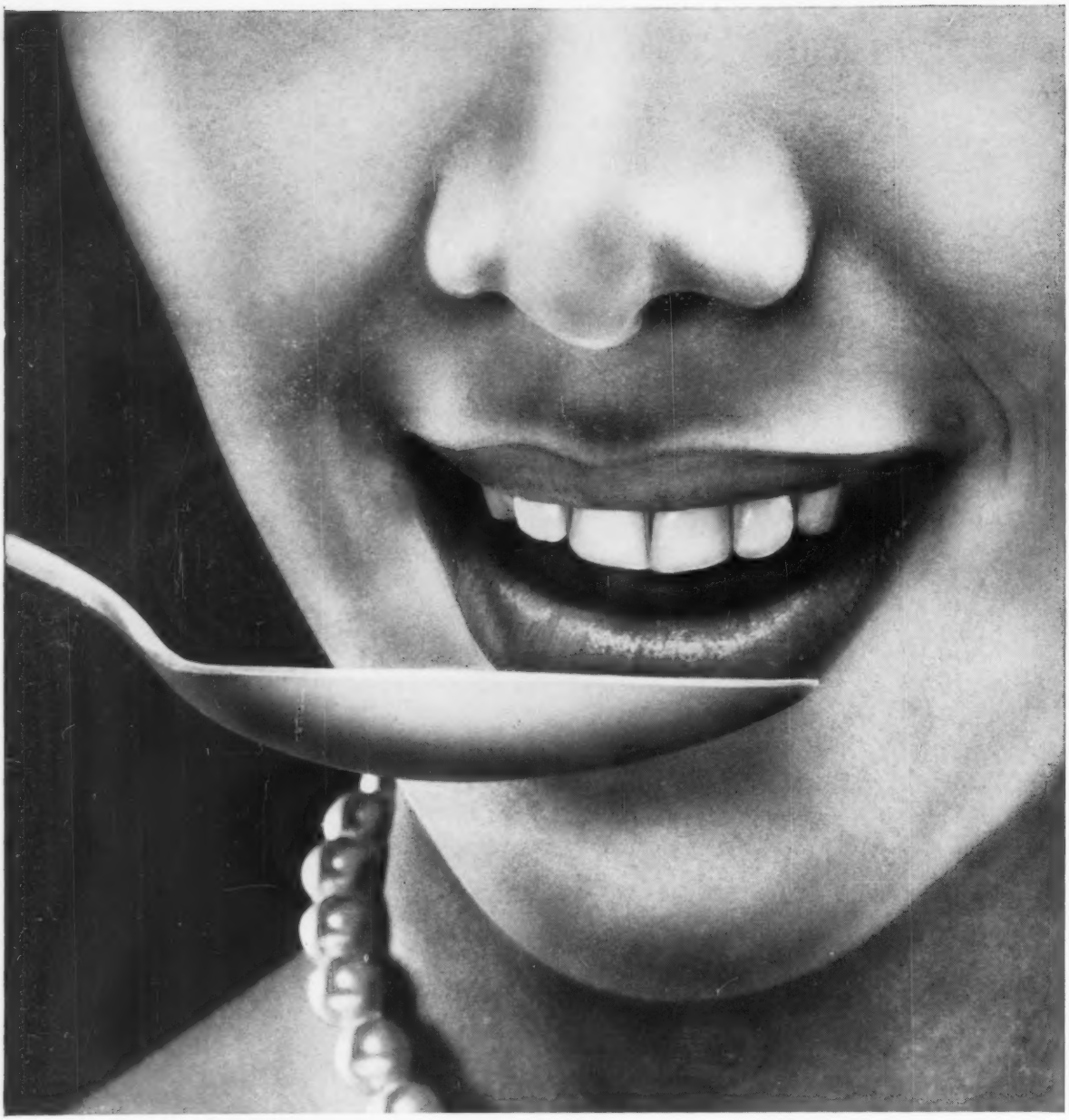
CIRCLE 95 ON INQUIRY CARD ➔

flavor by Webb

Tropical coconut is one of the many flawless, synthetic food flavors by Webb. It is available in several liquid forms, and spray-dried, to suit all applications. For samples, and information about any of the Webb specialty flavors (such as coconut, banana, pineapple), or the wide variety of standard flavors, please call or write Webb. Food flavor specialists for over 50 years.

R. D. WEBB & CO., INC

STIMPSON AVENUE AND STILES STREET, LINDEN, NEW JERSEY



IMPROVE FLAVOR AT RETORT TEMPERATURES WITH STABILIZED HVP-PROZATE

If you process meats, soups or other canned goods that are subjected to high retort temperatures, look to HVP-Prozate for heat-stable flavor.

Prozate® is a hydrolyzed vegetable protein flavoring agent that has been specially stabilized to withstand high temperatures. It is derived from plant protein and imparts either a rich, meaty flavor or a pleasant background flavor, depending on concentration. Prozate is easy to use, can be quickly incorporated into your present formula, and a little goes a long way.

In addition to HVP-Prozate, Hercules offers a full line of other HVP® products tailored to meet the specialized needs of the food industry. For details about Prozate and a sample of it—or for technical help—write to Hercules.

HERCULES POWDER COMPANY
INCORPORATED

CH61-2

Cellulose & Protein Products Department • Hercules Tower, 910 Market Street, Wilmington 99, Delaware

new equipment & supplies

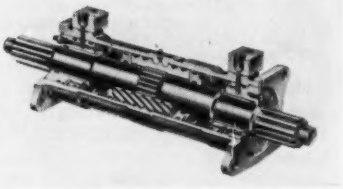
Fibre-Glass Tubing

Light weight, strength, and corrosion resistance are advantages cited for a new line of centrifugally molded fibre-glass tubing.

Smooth and chemically inert, tubing easily handles liquids, grains, and powders at pressures to 150 psi., temperatures from —65F. to 110F., or to 250F. in non-pressure service. Other applications include conveying of dust and corrosive fumes.

Tubing is available in lengths of 3-7 ft., diameters of 6-28½ in. Wall thicknesses range to ⅝ in., and a wide range of molded-in colors permits color coding. Material can be easily sawed, machined, drilled, threaded, quickly connected with sleeve couplings, or joined with adhesives. Rated tensile strength exceeds 17,000 psi., and tubing requires supports only at 5-ft. intervals.—*Apex Fibre-Glass Products, Cleveland.*

Circle 401 On Inquiry Card



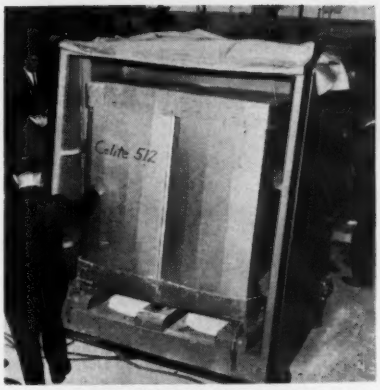
Efficient Torque Actuator

In converting hydraulic pressure into mechanical torque, this rotary actuator offers angular rotation to 200 deg.

Unit can be used to lift, dump, open, close, transfer, position, index, etc. It operates on pressures to 5,000 psi. with low flow of hydraulic fluid. Output ranges to 500,000 in.-lb.

Deceleration at limits of rotation is controlled and cushioned. Torque is constant regardless of shaft angular position.—*Menasco Mfg. Co., Burbank, Calif.*

Circle 402 On Inquiry Card



AUTOMATIC UNLOADER vibrates special 1,200-lb. carton to deliver controlled stream of filter aid. Carton is handled by fork truck.

DISCHARGE GATE regulates the flow. Material drops to floor in demonstration, but in actual operation would be conveyed directly to process.

Carton Unloader Cuts Handling Costs

Designed to tilt, open, and unload a special 1,200-lb. carton of diatomaceous earth or similar dry materials, this unit promises to cut filter-aid handling costs as much as 75%. Particular application for the equipment is seen in sugar refineries and breweries.

General practice has been to ship filter aid in 50-lb. bags, which, for large users, entails tedious opening and emptying plus possible spillage. In contrast, the unloader delivers up to 100 lb. per min. and can feed material directly to a central slurry system or batch tank.

Thus, this equipment offers the time and labor saving advantages of automatic unloading to users of dry materials without investment in a pneumatic-handling system or storage of carload lots. Cost of the unloader is about one-twentieth that of pneumatic systems, and the unit is portable.

The special carton, which holds the equivalent of 24 50-lb. bags, was developed by Johns-Manville for its Celite filter aid. It can be used with the automatic feeder or be unloaded manually. Cartons have a built-in pallet, can be stacked three high, and are 54x40x60 in.

In operation, the fully enclosed unit is loaded by fork truck. Machine holds the carton firmly in place and tilted at a 20-deg. angle. It punches two openings in the lower side, then vibrates the carton to deliver dry material in a continuous controlled stream. Flow is adjusted by a manually controlled gate that allows any rate from zero to feeder's full capacity.

During a test run, the entire carton was unloaded in about 15

SERVICE CENTER

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Reduce electrode installation and meter down-time to seconds! Eliminate pulling cumbersome, inconvenient cables through conduits after initial installation! Beckman glass and reference pH electrodes now feature capscrews for quick disconnect of spade lug connectors. Short, rugged, and compact bodies assure longer life in stream service. They're designed to meet the *specific* needs of industrial applications–and built for use with all-new Beckman Model J pH Analyzer and mounting chambers.

- **Glass Electrodes** ... available in 3 types to handle all applications–Heavy-Duty General Purpose, Low-Resistance General Purpose, and E-2 Glass. Wide diameter adds strength and provides lowest possible electrical resistance for rapid response.
- **Reference Electrodes** ... also available in 3 types for any process application–simplifies selection for stream pressures from atmospheric to 100 psig.

For complete details on these rugged new pH electrodes, plus facts on new Model J pH Analyzer and electrode mounting chambers, contact your nearest Beckman Sales Engineer or write direct for Data File 18-12-16.

Beckman INSTRUMENTS, INC.
SCIENTIFIC AND PROCESS INSTRUMENTS DIVISION
Fullerton, California

Equipment & Supplies (continued)

min. Since the unit is closed by a plastic curtain, there is no loss of material to the surroundings.—*Vibra Screw Feeders, Inc., Clifton, N. J.*

Circle 403 On Inquiry Card.

pH Analyzer System

This new pH analyzer system offers reliability, flexibility, and convenience.

Called Model J, it provides stability of 0.01 pH unit per 24 hr. over a–20 to 122F. ambient temperature range. Output accuracy and meter sensitivity is ±0.02 pH for the full 0-14 range. Unit is available with both milliampere and millivolt output for use with any potentiometric or current-type recorded. It is also available with millivolt output only.

Solid-state electronics, low-cost plug-in components and circuits reduce long-term maintenance costs and simplify service. Chassis slides out of case on rails for rapid, simple inspection. By disconnecting two plugs, entire chassis can be removed from case.

New glass and reference electrodes have short, compact bodies for added strength. Electrode cable fastens with capscrews for quick connection and disconnection. Electrode immersion and flow chambers are conveniently installed and maintained. — *Beckman Instruments, Inc., Fullerton, Calif.*

Circle 404 On Inquiry Card.

Mixer's Performance Is Easily Adjustable

Turbine mixers with adjustable rotor-stator clearance regulate shear and dispersing actions.

Decreasing the distance between rotor and stator increases homogenizing and dispersing. Increasing the distance ups the pumping, blending, and mixing actions, also increases mixer's capacity. Adjustments are made on the stainless-steel rotor assembly by turning a motor-shaft adjusting nut. — *Barrington Industries, Inc., Providence, R. I.*

Circle 405 On Inquiry Card.

Transparent Label Gum

Improved labeling of glass containers is offered by a new-type bottle gum which reportedly dries completely transparent on the bottle.

Known as Clear-Tak, it eliminates stringing, gumming-up, or dripping on containers or labeling equipment. Product has high solids content, quick wet tack, and resistance to adverse effects of high and low humidity.—*H. B. Fuller Co., St. Paul, Minn.*

Circle 406 On Inquiry Card.

Homogenizer Valve Control, which replaces complete handwheel assembly, simplifies pressure settings, improves operating efficiency. Pressure is applied by turning a knob on the panel. Unit is specifically designed for CIP.—Manton-Gaulin, Everett, Mass.

Circle 407 On Inquiry Card.

Produce Washer handling up to 24,000 lb. of potatoes per hr. improves caustic-peeling efficiency. Unit has six horizontal brushes arranged in a circular pattern.—Veg-A-Peel Co., Creston, Iowa.

Circle 408 On Inquiry Card.

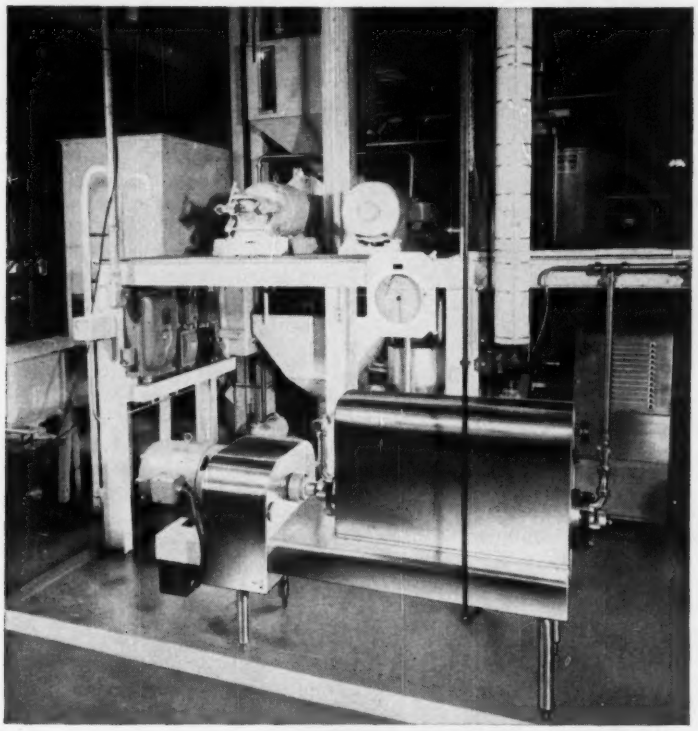
Cube-Sugar Cartoner feeds and opens cartons automatically, fills 144 cartons per min. with four tiers of 49 cubes each. Flaking of granules is prevented by use of stainless-steel infeed belts.—R. A. Jones & Co., Cincinnati, Ohio.

Circle 409 On Inquiry Card.

FOR MORE INFORMATION...

... simply circle key item number on handy Inquiry Card—back of book. Then print your name and address, and mail. For your convenience, these items are also listed and keyed in Reader Inquiry section.

ANOTHER FOOD PROCESSOR PROTECTS QUALITY AND PROFITS WITH *Creamery Package*® EQUIPMENT



CP® EQUIPMENT

processes...

pumps...

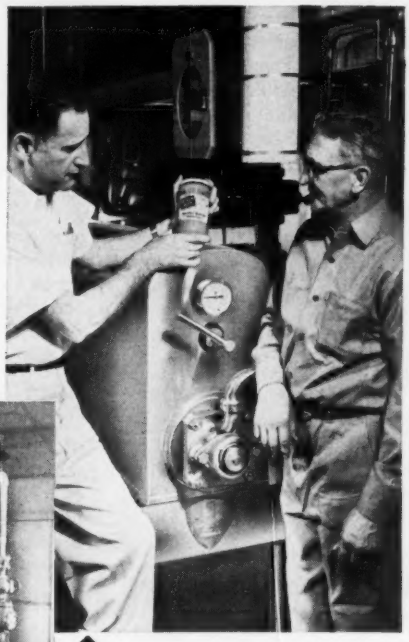
protects...

PEANUT BUTTER

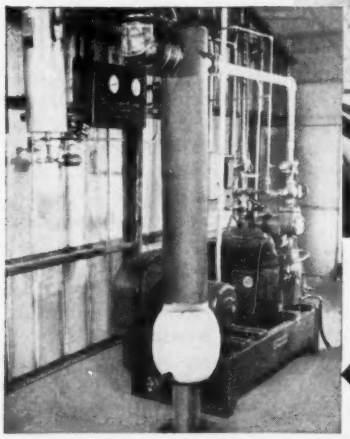
at WM. BARNES, INC.
Minneapolis

Swept Surface
CHILLER

Cold-pack processing of peanut butter at Wm. Barnes, Inc. centers around this compact CP Swept-Surface® Peanut Butter Chiller. Exclusive CP Dasher Blades continuously sweep peanut butter away from cooling surfaces to drop temperature from 180°F to 100°F at 2500-2800 lb./hr. CP Rotary Pumps move peanut butter to chiller.



Recognized quality of "Billy Boy" brand peanut butter is checked throughout processing cycle.



This space-saving CP type "K" four-cylinder 3½ x 3½ Ammonia Compressor does double duty, serves the Swept-Surface® Chiller and a frozen fruit storage room.

This compact, efficient processing facility co-ordinates a CP Swept-Surface® Chiller, CP Sanitary Stainless Rotary Pumps, and a CP Ammonia Compressor to meet exact processing needs.

CP Engineering can do the same for you. Modern, cost-cutting CP processing, handling and storage equipment can be combined into a smoothly operating processing center—automated, if desired—to fit almost *any* food plant requirement. Your local CP Representative is available for consultation; write us to have him contact you now.

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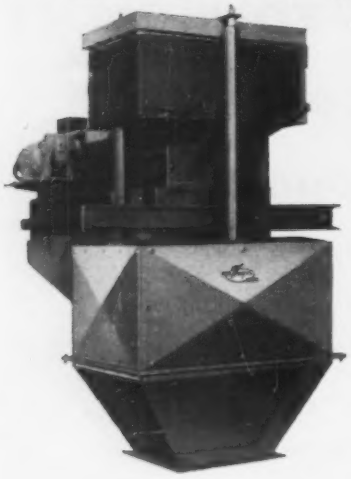
STOP PROFIT GIVE-AWAY



stay competitive with accurate Thayer scales

For 11 years a Florida fertilizer plant has kept costs down and profits up with 1 Thayer Scale. The Florida plant remains a keen competitor because of accurate weight control, low overhead and greater dollar return on its investment.

The Thayer Scale has required no maintenance and continues to give "new scale" accuracy in spite of millions of weighings of abrasive rock dusts.

Unlike conventional scales, the Thayer Scale has no knife edge pivots to wear and cause inaccurate weighing. The Flexure-Plate suspension system of the Thayer Scale cannot wear, requires no maintenance, and accuracy is guaranteed for millions of weighings.

Call or write Thayer Scale for recommendations on improving or maintaining your competitive position through precise weight control.

BAGGING, BATCHING, METERING, CHECKWEIGHING and CUSTOM DESIGNED SCALES.

THE Thayer SCALE

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A Subsidiary of Sundstrand Corporation

Plant Sanitation & Maintenance

Portable Spray Washer

Light and compact for easy portability, a new spray-wash unit develops pressure in excess of 400 psi. This high pressure, combined with various chemical compounds, simplifies cleaning. Typical applications include washing of bottling machines, cutting tables, floors, and vehicles.

Known as "Nelco," a unique mount permits its use on any size drum. Unit's self-contained electric motor powers a two-cylinder pressure pump, and all components are corrosion-resistant. A 35 ft. hose comes with the equipment.—*National Equipment and Leasing Co., San Antonio, Tex.*

Circle 413 On Inquiry Card

Plastic Cement Compound Resurfaces Worn Floors

Trowelled to a depth of ½-in. or more, this plastic flooring compound offers permanent, resilient repairs for all worn, cracked, and damaged wood, concrete, and mastic floors.

Material contains special chemical agents which impart high tensile, flexural, compressive, and bond strengths. Flooring resists excessive moisture, oil, grease, solvents, salts, and mild acids and alkalis. Cement-colored product is merely trowelled on after floor surface has been cleaned and primed. There is no need to chip, dig, or roughen the area to be repaired.

Providing a non-slip surface that absorbs impacts and heavy trucking, material sets up for light traffic in 12 hr., moderate traffic in 48 hr., and constant heavy traffic in 72 hr. It is supplied in steel drums containing all materials for complete repair. A full unit contains compound to cover 100 sq. ft. to a thickness of ½-in.—*The Monroe Co., Cleveland.*

Circle 414 On Inquiry Card

Plastic Coating for beverage-processing vessels is tough and noncontaminating. Epoxy formulation (Pfaudlon 201) is applied to base metal with conventional spraying equipment, then is heat cured. It is easily cleaned by conventional or CIP methods.—The Pfaudler Co., Rochester, N. Y.

Circle 415 On Inquiry Card

Liquid Concentrates, such as automation acids and alkaline detergents, caustics, and hypochlorites are available in bulk. A special 3,000-gal. compartmented tank truck carries a mixed load to cut transportation costs. — Klenzade Products, Inc., Beloit, Wis.

Circle 416 On Inquiry Card

Oscillating-Type Spray Washer (250 psi.) efficiently handles vehicles of odd configuration, for which brush-type units would not be suitable. System (Oscillaspray) includes a pre-wet spray arch, detergent mixing and storage tank, and automatic controls.—Ross and White Co., Wheeling, Ill.

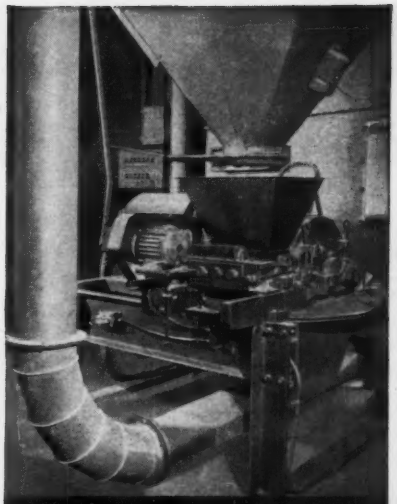
Circle 417 On Inquiry Card

Organic Chlorine Sanitizer, containing 25% available chlorine, is quickly and instantly soluble in water of any hardness. Product (Quik-Klor) rinses freely and is comparatively non-corrosive. Packaged in 25- and 100-lb. drums.—Borden Special Products Co., New York City.

Circle 418 On Inquiry Card

ON CALL TO THE PROCESSING INDUSTRIES

If there is magic in dependable, reliable service, it's a magic compounded from skill, experience and modern know-how. When projects or problems arise in grinding, air conveying and product recovery, more and more processors in all parts of the country are summoning MIKRO-Products. They have discovered, as you will, that MIKRO-trademarked equipment—and the highly-trained specialists who design, produce and service it—can work wonders in meeting your budget and production requirements.



MEER CORPORATION CONTROLS QUALITY, UPS PRODUCTION WITH MIKRO-Products

Meer Corporation, Bergen, N. J. employs a unique3-levelautomatic milling operation to handle gum arabic. A MIKRO-PULSAIRE Dust Collector serves as a receiver-filter in an air-conveying system which insures a constant high-volume flow of materials between all units in the installation, including a No. 4 MIKRO-PULVERIZER, as shown above. Results are better quality control and virtually doubled production. We'd like to show you how MIKRO-Products can do just such a job for you.

PROCESSING SYSTEMS

MIKRO-Products....

PULVERIZING MACHINERY COMPANY
97 Chatham Rd., Summit, N. J.
A Division of American-Marietta Company

REPRESENTED THROUGHOUT THE WORLD IN SALES, SERVICE AND MANUFACTURING FACILITIES.

CIRCLE 101 ON INQUIRY CARD

Food Ingredients & Additives

Fungal Enzyme Converts Carbohydrates Efficiently

Starch, oligosaccharides, and dextrins may be efficiently converted to dextrose with use of a new fungal-enzyme preparation.

Enzymic conversion is said to have marked advantage over acid hydrolysis of starch for dextrose production in that it produces complete hydrolysis of the starch without forming reversion products. Such products lower crystalline dextrose yield and are not fermentable. Thus, the enzyme has useful application in production of crystalline dextrose and sugar solutions for fermentations.

Called Diazyme, the formulation contains an active amyloglucosidase enzyme which splits glucose from the nonreducing ends of starch or oligosaccharides chains. Therefore, it can hydrolyze maltose, isomaltose, higher oligosaccharides, and both the linear amylose and branched amylopectin fractions of starch completely to glucose.

New Starch Converter's Operating Range

pH: 4.0-5.0, optimum about 4.5.
Temperature: 40-60C., optimum about 50C.
Incubation time: 24-96 hr.
Starch concentration: To 50%.
Dosage: 50-100 enzyme units per lb. of starch.

While optimum pH of 4.5 is recommended, almost equally good results are obtained throughout the pH range. As an economy measure, temperatures up to 60C. may be used to obviate possibility of microbial contamination during long incubation periods. Complete conversion can be obtained in 24 hr. through use of high enzyme levels. Lower levels lengthen incubation to 72-96 hr.

Starch concentrations to 50% are easily converted to dextrose but lower concentrations, 20-35%, facilitate handling. For best conversion, the starch must be gelatinized and thinned by cooking with dilute acid or through liquefying bacterial amylase. — *Miles Chemical Co., Elkhart, Ind.*

Circle 419 On Inquiry Card.

New Enzyme Formulation Boosts Tenderizing Action

Meat tenderization may be improved with use of new enzyme formulations containing papain and pyrophosphates as carriers.

Cuts treated with proteolytic enzyme alone have many shortcomings. The most serious problem is that the enzyme continues to act on the meat surface and makes it mushy unless the action is stopped promptly by freezing or cooking.

When enzymes are applied by dipping, the action is primarily a surface phenomenon. Deep tissue remains unattacked, while the surface becomes soft and mushy. Furthermore, in the live-injection method, edible glands and organs are also tenderized and are less desirable.

However a carrier, such as a pyrophosphate, can be used to convey the enzyme through osmosis into the deep tissues. The action can be so controlled that a lower concentration of enzyme can be used, while efficient tenderization is achieved by the more uniform distribution of enzyme.

Thus, when meat is dipped in a phosphate solution containing a small amount of active enzyme, it can be held for up to 5 days at 32-38F. without any apparent softening of tissues.

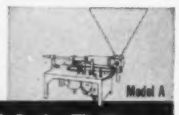
A formulation that proved particularly effective in tests conducted at Michigan State U. contains 0.6 g. of papain and 17½ oz. of pyrophosphates per gal.—*The Griffith Laboratories, Inc., Chicago.*

Circle 420 On Inquiry Card.

New Source of quality-controlled citrus oils is announced by two major flavor producers. The line (Citrus Valley Brand) includes USP lemon and orange oils packed in epoxy-lined drums.—Fritzsche Brothers, Inc., and Dodge & Olcott Inc., New York City.

Circle 421 On Inquiry Card

For straight line twin filling



SIMPLEX PISTON FILLER

Fast, accurate filling of liquids or semi-solids into cans, glass containers or plastic bottles

Simplex Twin Piston
25 to 80 containers per minute!
2 oz. to quarts & gallons.

- REMARKABLY SIMPLE CONSTRUCTION—VIRTUALLY MAINTENANCE-FREE!
- EASILY CLEANED IN A FEW MINUTES!
- HAND LEVER CUTS OFF FLOW INSTANTANEOUSLY!
- DURABLE 316 STAINLESS STEEL IMPERVIOUS TO ACIDS!
- EVERY MODEL ENGINEERED TO CUSTOMER REQUIREMENTS FOR GIVEN RANGE OF OPERATIONS!

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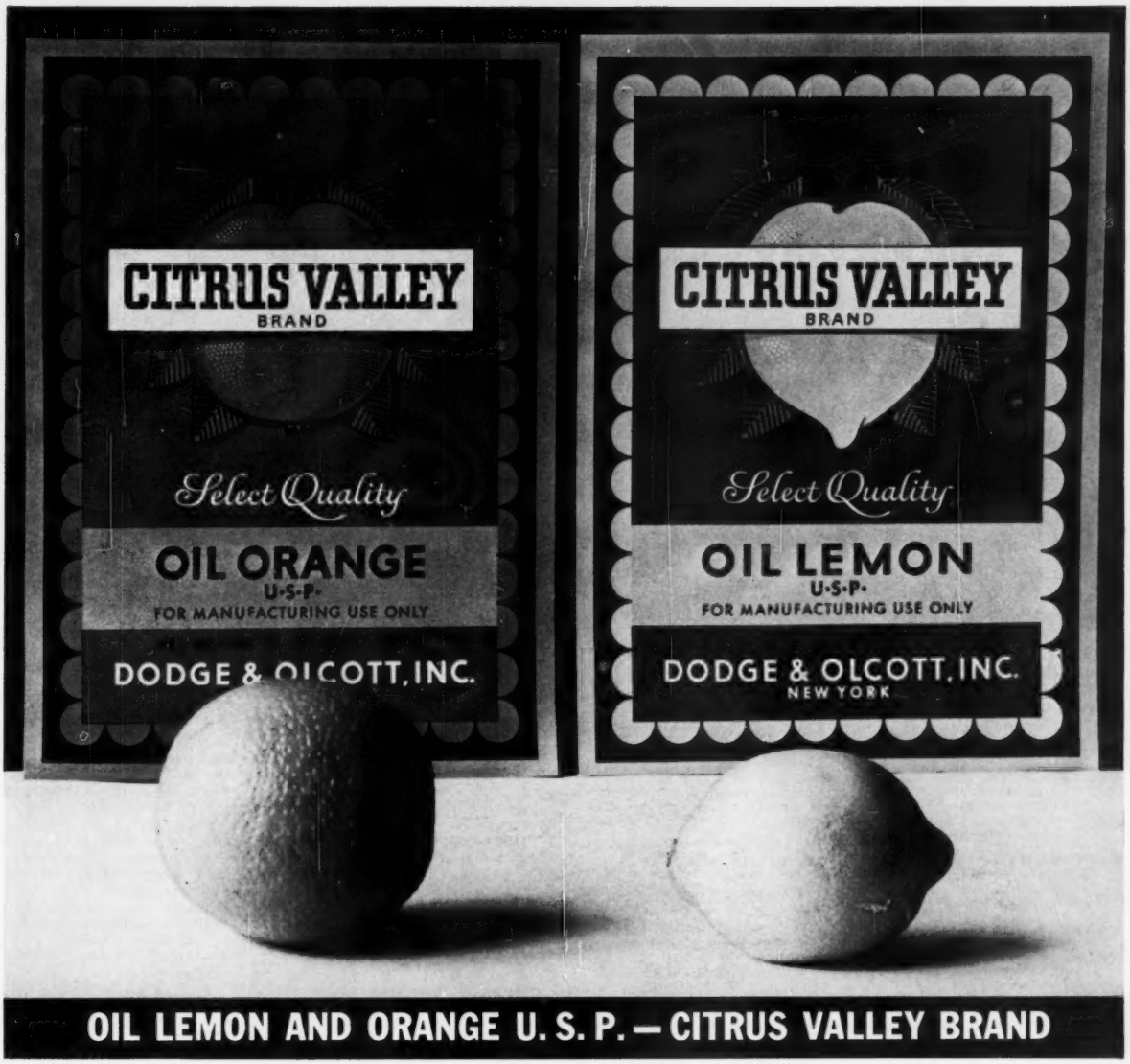
CIRCLE 102 ON INQUIRY CARD



OIL LEMON AND ORANGE U. S. P. — CITRUS VALLEY BRAND

D&O announces it will carry fine, uniform quality lemon and orange oils under the label CITRUS VALLEY BRAND. D&O is now in the position to assure large quantities and prompt delivery, along with contract coverage to those customers desiring this protection. These oils are of excellent quality, laboratory controlled for lot uniformity, and in most respects superior to known brands now on the market. Contact your local representative or New York office for sample quantities.

Dodge & Olcott Inc.

Manhattan Industrial Center
Seventy-Five 9th Avenue
New York 11, New York

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PLANT ENGINEERING

STAINLESS ROTORY PUMPS. Describes firm's line with applications in canning, baking, beverage, and dairy industries, including details on auxiliary equipment. 8p.—The Creamery Package Mfg. Co., Chicago. **(211)**

VALVE SIZING. Provides an explanation of what occurs in undersized, oversized, and correctly sized pressure reducing applications, including illustrations and details on advantages of correct sizing. 4p.—OPW-Jordan Corp., Cincinnati. **(212)**

ELECTROHYDRAULIC PUMPS. Introduces complete unit line and system components, including complete application and performance data. 20p.—The Oilgear Co., Milwaukee. **(213)**

TANKS & PRESSURE VESSELS. Gives a behind-the-scenes picture of materials and techniques used in construction of plate-fabricated equipment, including details on complete product line. 36p.—Nooter Corp., St. Louis. **(214)**

SMALL STEEL GATE VALVES. Describes inside-screw rising stem, solid-wedge disc, and rolled-in seat rings of units rated at 800 lb./85OF. and 2000 lb./100F. 2p. Lunkenheimer Co., Cincinnati. **(215)**

PROPORTIONING PUMPS. Includes capacity and selection tables plus detailed descriptions of unique hypocycloidal gear arrangement on all units in firm's line. 12p.—Jaeco Pump Co., Villanova, Pa. **(216)**

PRESSURE HOSE. Describes interlocked type for loading, unloading, and conveying of steam or high temperature liquids, including charts showing specs and working pressure correction factors. 6p.—Atlantic Metal Hose Co., NYC. **(217)**

INERT GAS GENERATORS. Charts, drawings, and photos explain how units operate to produce inert gases economically, preventing fire and explosions, and increasing production. 8p.—C. M. Kemp Mfg. Co., Glen Burnie, Md. **(218)**

DISPLACEMENT BLOWERS. Outlines advantages of rotory positive types, including positive volume displacement, and horsepower saving flexibility for high volumetric efficiency. 6p.—Dresser Industries, Connersville, Ind. **(219)**

PNEUMATIC SPRAY NOZZLES. Complete line of atomizing units, offered in models with special mounting plate, automatic clean-out needle, and manually operated auxiliary shut-off needle assembly and extensions, are described and illustrated. 4p.—Spraying Systems Co., Bellwood, Ill. **(220)**

GATE VALVES. Designed to withstand corrosive actions too severe for lighter valves, a full line of iron and bronze units are described and illustrated with applications, features, and design data. 4p.—Lunkenheimer, Cincinnati, O. **(221)**

CANNED PUMPS. Provides design and construction features of new type unit which permits efficient and safe handling of "problem" liquids and requires minimum space and plumbing. 4p.—Allis-Chalmers Mfg. Co., Milwaukee. **(222)**

PROCESSING

CONTINUOUS FOOD FRYER. Labor saving unit with tank designed to hold minimum oil volume and conveyor belt that carries sediment out of oil, is illustrated and described. 2p.—Jabez Burns & Sons, NYC. **(225)**

WATER FILTERS. Polishing type unit, effective on particles as small as one micron, and suitable for water temperatures up to 140-deg. F. with plastic tubular elements and 140-deg. to 300-deg. with stainless elements, is detailed. 4p.—Hagan Chemicals & Controls, Pittsburgh. **(226)**

MAGNETIC FILTRATION/WET SEPARATION. Equipment designed for protection of liquid lines and processing units from iron contamination, are described and illustrated with detailed specs. 6p.—Eriez Mfg. Co., Erie, Pa. **(227)**

HUMANE SLAUGHTERING UNITS. Equipment designed to meet Federal regulations are described and illustrated, including case histories of proven ways to put plants in compliance with electric stunning. 6p.—Cincinnati Butchers' Supply Co., Cincinnati. **(228)**

ELECTRONIC WATER STERILIZER. Offering instant sterilization without chlorination, heating and cooling, or tank storage, unique new unit is described and illustrated with specs and operating data. 4p.—Water Processing Assoc., Orange, Calif. **(229)**

DRY INGREDIENTS FEEDER. Describes unit for continuous metering into fluid products at a predetermined rate such foods as flake coconut, raisins, peanuts, granular salt, cut dried fruit, etc. 2p.—The Creamery Package Mfg. Co., Chicago. **(230)**

VIBRATORY SCREENS/CONVEYORS. Illustrates unit's exclusive true balanced-mass design and point-of-no-oscillation suspension with photos and drawings. 8p.—COMCO Corp., Philadelphia. **(231)**

CRUSHER. Details a 62" wide saw tooth unit to take continuous discharge from wide conveyor belts or dryers and crush to a prescribed ring size with minimum "fines." 2p.—Sprout, Waldron & Co., Muncy, Pa. **(232)**

CASCADE CONTROL. Outlines elements and advantages of cascade control and points up firm's systems that achieve this type of control. 4p.—Fischer & Porter Co., Warminster, Pa. **(233)**

CONTINUOUS FREEZING EQUIPMENT. New continuous-process, low temperature units that chill ice cream, ice milk, and sherbert to new low discharge temperatures of 16 to 18F are detailed.—Chemetron Corp., Louisville, Ky. **(234)**

VIBRATORY SCREEN. Describes specs, dimensions, weights, and product features, including dimension drawings and photos of horizontal unit. 2p.—COMCO Corp., Philadelphia. **(235)**

CONTINUOUS MIXERS. Dimensions and power requirements are charted for 14 standard sizes in double shaft and single shaft models, including standard and special design types. 8p.—Falls Industries Inc., Solon, O. **(236)**

COTTAGE CHEESE EQUIPMENT. Detailed discussion with diagrams and pictures point up features and advantages of new unit line. 8p.—Kusel Dairy Equipment Co., Watertown, Wis. **(237)**

PACKAGING

CREATIVE PACKAGE DESIGN. Outlines firm's available services for "imagination impact" in creative package design, geared to make your package sell better. 10p.—Paramount Packaging Co., Philadelphia. **(239)**

POLYETHYLENE. Designed to clarify standards and uses of poly packaging materials through discussion of lab methods used in design of poly films for specific needs.—Pollock Paper Co., Dallas. **(240)**

CORRUGATED CONTAINER COLORS. Shows when to use color in packaging, then provides guide rules for selecting best color combinations to reflect nature of product. 20p.—Stone Container Corp., Chicago. **(241)**

LIQUID FILLERS. Details complete line of vacuum or gravity units with stainless liquid contact parts in semi- or fully-automatic types. 4p.—Ertel Engineering Corp., Kingston, N. Y. **(242)**

(Continued on page 106)

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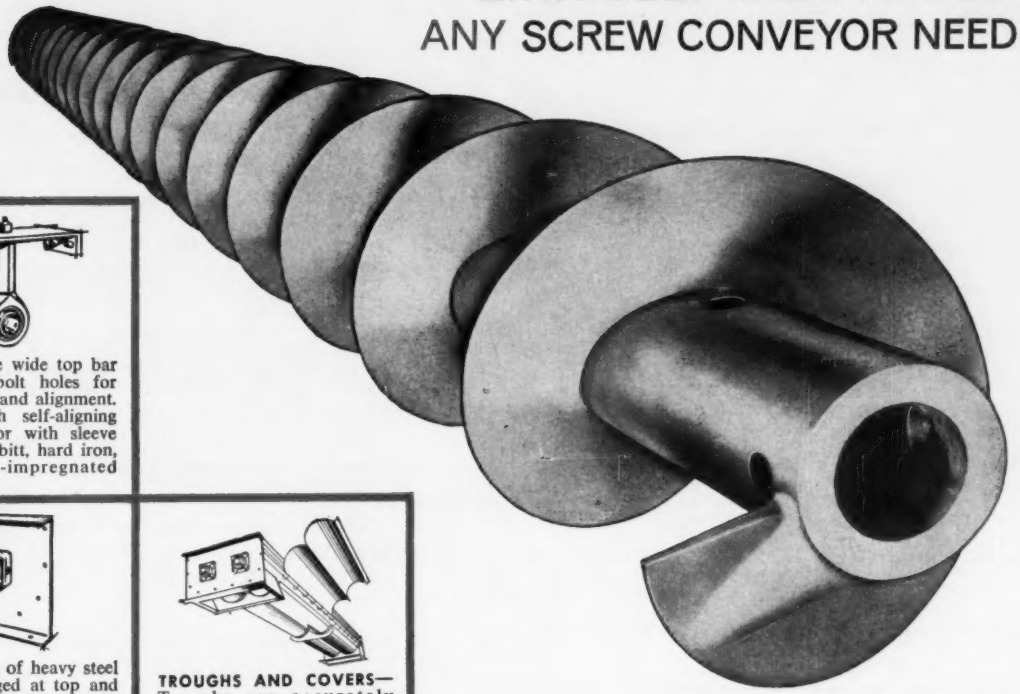
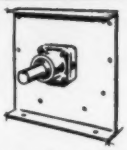


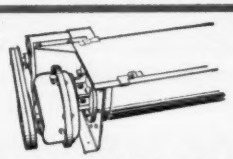
HANGERS have wide top bar with slotted bolt holes for easy assembly and alignment. Available with self-aligning ball bearing or with sleeve bearing in babbitt, hard iron, bronze or oil-impregnated wood.



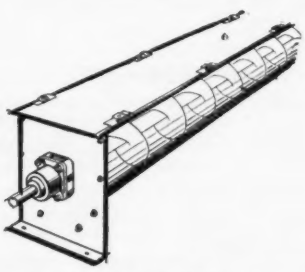
TROUGH ENDS of heavy steel plate are flanged at top and bottom. Furnished with babbitted, bronze or single or double ball bearing flange block with or without trough end seal. Blocks are interchangeable.

TROUGHS AND COVERS—Troughs are accurately formed and jig-assembled. Drop-bottom type facilitates cleaning. Covers can be *semi-flanged,* spring clamped type to facilitate removal.

QUIK-LINK CONVEYOR SCREW. For ease in removal of conveyor section without disturbing other components. Can be furnished on helicoid and sectional flight conveyors.



DRIVES—Link-Belt shaft-mounted speed reducers are simple, compact, rugged — designed for easy mounting on trough end plate. Motogears and gearmotors with roller chain drives can also be furnished.



TYPICAL LINE OF SCREW CONVEYOR—All components required to make up a complete screw conveyor are available from Link-Belt. One call, one order, one shipment for all your needs. And, you have the benefits of one-source responsibility.

SINGLE COMPONENT OR COMPLETE SYSTEM—STANDARD OR SPECIAL REQUIREMENTS! Yes, *you call the turn* . . . and you can count on Link-Belt to come up with the *right* answer.

Link-Belt offers conveyor screws in any suitable metal to meet temperature, corrosion, sanitation, abrasion and other requirements. Numerous *standard* types are available from stock in black and stainless steel. And if these can't solve your problem, our engineers will design an economical answer. We have furnished conveyor screws ranging from 1½ inches to over eight feet in diameter . . . with trough clearances as close as 1/32". What are your needs?.

Link-Belt offers an equally broad selection of all other components. All are built to rigid quality standards, made to fit together accurately to assure easy assembly . . . smooth, long-life operation.

You'll find Link-Belt screw conveyor components conveniently available from stock in your area. And expert engineering assistance may be obtained through any Link-Belt office. For details, contact your nearest Link-Belt office or authorized stock-carrying distributor. Ask for Book 2989.

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PRESSURE SENSITIVE LABELS. Features application ideas and details five basic types in variety of sizes, shapes, stocks, and colors. 4p.—National Tag Co., Dayton, O. **(243)**

CASE PACKERS. Continuous motion units are described and illustrated including data on completely automatic performance for packing all container types in cases or shipping cartons, and casing wrap-around packs in shipping trays or flapped cartons. 8p.—Geo. J. Meyer Mfg. Co., Worcester, Mass. **(244)**

MATERIALS HANDLING

FORK TRUCK. Details gasoline-powered unit of 1000 lb. capacity, including complete specs, capacity charts, upright dimensions, and drawbar pull data. 4p.—Clark Equipment Co., Battle Creek, Mich. **(266)**

CONVEYOR HP REQUIREMENTS. Results of study by Penna. State Univ. provides techniques to analyze separately the power consumed by troughing idlers, return idlers, return strand of belting, and carrying belt (loaded and unloaded). 27p.—Hewitt-Robins, Stamford, Conn. **(267)**

ECONOMIC TRUCK OPERATION. Shows how major food firm mechanized food handling with 14 electric powered trucks and obtained operating costs of only $1.92/day. 6p.—Lewis-Shepard Products Inc., Watertown, Mass. **(268)**

ELECTRIC VIBRATORS. Complete data and specs of 14 "pulsating-magnet" models, as well as three pneumatic and hydraulic units are presented. 12p.—Syntron Co., Homer City, Pa. **(269)**

UNCASER. Explains and illustrates operation of revolutionary new unit with protective nylon hunting fingers designed for speed and efficiency. 4p.—Geo. J. Meyer Mfg. Co., Milwaukee. **(270)**

TANK WEIGHING SCALES. Details construction features that prevents side or end thrusts and platform loading shocks from reaching knife edges.—Howe Scale Co., Rutland, Vt. **(271)**

LIFT TRUCKS. Engineering, construction and operating features of seven new units, including three special models, are interestingly highlighted. 24p.—Allis-Chalmers Mfg. Co., Milwaukee. **(273)**

TRANSPORT REFRIGERATION. Carbon dioxide type units for over-the-road or piggy-back trailers, multiple-stop delivery trucks and demountable containers is described.—Chemetron Corp., Chicago. **(274)**

SANITATION & MAINTENANCE

URETHANE COATINGS. Shows how product provides superiority in resistance against chemicals, corrosion, abrasion, weather, and wear. 4p.—Better Finishes & Coatings Inc., Newark, N. J. **(251)**

DUST COLLECTOR. Explains versatile cloth filter bag unit—its construction, operation, range of use, application, special features and details. 4p.—Pangborn Corp., Hagerstown, Md. **(252)**

PLANT CLEANERS & SANITIZERS. Details cleaners, germicides, floor waxes, and other maintenance products for food processing applications.—Puritan Chemical Co., Atlanta. **(253)**

GRATING & STAIR TREADS. Provides complete specs for electroforged carbon steel and rectangular and U-shaped interlocked aluminum units. 4p.—Blaw-Knox Co., Pittsburgh. **(254)**

DUST MASKS. Details low cost, low upkeep types, of four-part design with easily interlocking, washable parts. 2p.—Flexo Products Inc., Westlake, O. **(255)**

CORROSION RESISTANT GROUT. Ready-to-use epoxy grouts and mortars are described with detailed specs and one step mixing instructions. Offers resistance to lactic acids and most other acids found in food plants.—Steelcote Mfg. Co., St. Louis. **(256)**

PROTECTIVE GLOVES. Provides relative resistance ratings of glove materials to solutions commonly found in food plants, including data on tensile strength and heat resistance. 20p.—Wilson Rubber Co., Canton, O. **(257)**

FANS, BLOWERS & HEATERS. Covers new square exhaust fans and several new ceiling heaters, including illustrated index for fast reference. 10p.—Emerson Electric Co., St. Louis. **(258)**

SAFETY GLASSES. Introduces redesigned line with new 40% stronger seven-barrel hinge and new temple screw which keeps temples tight permanently. 2p.—American Optical Co., Southbridge, Mass. **(259)**

MARKETING

POTATO SURVEY. Nation-wide study gives incidence of serving potatoes, how served, use of instant and frozen potatoes, and brands tried among upper, middle, and lower income families. 21p.—Curtis Publishing Co., Philadelphia. **(291)**

R. I. FOOD DISTRIBUTION. USDA study details Rhode Island's present marketing operations in wholesale food distribution, including recommendations for improved operations. 75p.—USDA, Washington, D. C. **(292)**

FROZEN FOOD BIBLIOGRAPHY. Contains selected references on marketing and processing of frozen foods.—USDA, Washington, D. C. **(294)**

WORLD FOOD BUDGET STUDY. Using '58 as the base year, study projects—for '62 and '66—world food production, imports, expected consumption, and minimum level above expected consumption required to give people of the world an adequate diet.—USDA, Washington, D. C. **(295)**

MANAGEMENT

SOCIAL SECURITY BENEFITS. Clearly and thoroughly explains employee benefits under recently amended Social Security Act, including tips on what the new law means to you as well as your employees. 32p.—Commodity Research Publications Corp., NYC. **(301)**

EUROPEAN EXPANSION. Provides a guide to European Common Market with information on labor supply, wage rates, investment incentives, and market potential of each country. 39p.—First Nat'l City Bank of N. Y., NYC. **(302)**

PLANT SITES. Details methods of plant location selection, including preliminary planning, methods of administration, and pros and cons of area desirability. 4p.—Small Business Administration, Washington, D. C. **(303)**

NEW PRODUCT SERVICE. Outlines firm's service for food manufacturers who desire a basic knowledge of retail outlets for use in new product promotion. 15p.—A. C. Nielsen Co., Chicago. **(304)**

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CIRCLE 106 ON INQUIRY CARD

CIRCLE 107 ON INQUIRY CARD →

Fred Vahlsing and the TR-101 shipping bag for packaged carrots he introduced . . . his most recent innovation in a long line of produce packaging "firsts".

Vahlsing adopts shipping bag of MARLEX* TR-101 for packaged carrots . . . top-icing used

Fred Vahlsing, president and founder of Fred H. Vahlsing, Incorporated, has been a leader in the development of produce packaging for nearly four decades. With carrots, he was the first with such innovations as cleaned and wrapped bunches (first with, then without green tops), wire-bound shipping crates, multi-wall paper shipping bags . . . and now, he has adopted tough, lightweight shipping bags made of MARLEX TR-101 high density plastic.

"These new plastic bags of TR-101", he relates, "cut our shipping costs because they permit the use of inexpensive top-icing. The multi-wall paper bag, that's standard today, requires more expensive refrigeration. TR-101 bags, on the other hand, have the strength and moisture resistance to withstand top-icing. The bags we use are only 3¼ mils thick. MARLEX TR-101 is an unbelievably strong plastic."

In addition to strength and moisture resistance, bags made from MARLEX TR-101 high density resin can withstand extremes of temperature (from hot storage at 140°F to cold storage below zero F) . . . and resist rot, fungi, and bacteria. Testing has also established that thinner-walled TR-101 bags outperform thicker-walled low density polyethylene bags . . . having up to 38% more tensile strength and 2½ times the impact strength.

For produce marketers and other bulk material packagers currently using paper, jute or low density polyethylene bags, metal or fiber drums, and the like . . . new TR-101 bag can mean more efficient packaging. They offer excellent protection against product loss from handling or moisture spoilage . . . attractive packaging with colored or translucent film . . . and reduced freight costs. TR-101 film is also easy to seal with automatic or hand sealing equipment now available.

* MARLEX is a trademark for Phillips family of olefin polymers.

For more information, see your package supplier . . . or contact us.

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Bartlesville, Oklahoma

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The Answer to Your Wash-Up Problems!

INSTANT HOT WATER MAKER

Equipped with 50 foot hose, water saver and spray nozzle. Mixes Steam and Cold water with no chance of Steam Burns! Economical and easy to use.

OPEN WALL TYPE

Hot and Cold Water or Steam and Cold Water right where you need it.

RECESSED WALL TYPE

For concealed piping on new installations. This unit is removable and the entire assembly is covered by an attractive stainless steel plate.

Consult your dealer for details and prices or write directly to us.

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Recent Inventions

PROCESSING

Preparing Yeast-Leavened Baked Goods by Mixing Emulsifier With Dry Ingredients.—W. M. Cochran, The Glidden Co., Cleveland. No. 2,978,329.

Removing Free Glucose From Pasteurized, Cooled Egg Whites for Drying Into Low Bacteria - Count Egg White Solids.—D. H. Bergquist, Hennigsen, N.Y.C. No. 2,982,663.

Selectivity and Automatically Feeding Liquid Ingredients with Warm Water into Mixing Chamber Followed with Feeding of Dry Ingredients with Cooling Water and Blending into Flowable Slurry Going into Processing of Bakery and Similar Products. — L. F. Patridge, Tuckahoe, N. Y. No. 2,987,016.

Inhibiting Discoloring of Cut Fruits and Vegetables by Applying to Cut Surfaces a Composition Comprising Water Soluble Solution of Calcium Ion, Phytate Anion and Anion of Edible, Water-Soluble Salt Other Than Phytic Acid.—C. D. Johnston, Fairfax County, Va. No. 2,987,401.

EQUIPMENT

Molding Machine For Forming a Rope of Sugar into Individual Seamless Tablets.—L. Brook, Baker Perkins, Ltd., Peterborough, Eng. No. 2,987,-015.

Machine for Severing Candy into Elongated Form and Then Shaping Each Cut Stick into a Candy Cane.—D. Pearson, Pearson Candy Co., Culver City, Calif. No. 2,987,017.

Roll Slicer Comprising Roll-Feeding Conveyor and Disk-Knife Members Carried by Shafts and Positioned Parallel to Conveyor. —D. S. Lecrone, Alto Corp., York, Pa. No. 2,987,089.

Machine for Peeling Crawfish Comprising Peeling Roller Forming Peeling Couple with a Support.—F. S. Lapeyre, The Peelers Co., Houma, La. No. 2,-987,759.

Kneading Machine With Kneading Trough Having Two Side-by-Side Kneader Shafts Rotating in Opposite directions with Top Portions of Shafts Moving Toward Each Other. — W. Grubenmann, Ciba Limited. Basel, Switz. No. 2,987,-760.

PACKAGING

Flexible Wrapper Sheet With Transparent Portion of Thermoplastic Material and Marginal Portion With Heat-Sealable Coating Activated at Temperature Lower Than Base Sheet.—S. Rosen, Milprint, Inc., Milwaukee. No. 2,992,117.

Insulated Shipping Container With Collapsible Interior Insulation. — W. L. Morrison, Liquefreeze Co., Inc., N. Y. C. No. 2,992,753.

Case Handling System for Automatically Pushing Parallel Lines of Stacks of Cases Onto a Horizontal Conveyor.—E. A. Verrinder, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,993,315.

Case Packer With Collecting Platform for Receiving Packages in Parallel Lanes and Case-Loading Chute.—C. E. Kerr, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,993,316.

Machine for Setting Up Flat Container Blanks With Bottom Panel and Side and End Panels Hinged Thereto. — G. C. Currie, Currie, Mfg. Co., Charlotte, N. C. No. 2,993,419.

Weight Classifying Device for Handling Packages. — R. A. Mahaffy, Bartlet Engineering Co., Rockford, Ill. No. 2,993,597.

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International Expansion

SOURCES AND METHODS OF INTERNATIONAL FINANCING *(Management Report No. 59). American Management Assn., 1515 Broadway, NYC 36, 1961. Price: $4.50 (AMA members: $3.00).*

Public and private sources of financial aid to U. S. businessmen engaging in overseas trade and investment are described in this vitally interesting new volume. Representatives of eight government and quasi-governmental agencies—including Britain's Export Credits Guarantee Dept.—contribute a chapter each on the aims and current operating procedures of their own agencies.

Among the private sources discussed are the corporations organized under provisions of the Enge Act, European commercial banks, Swiss credit institutions, and the Latin American capital market. A special feature of this report is an account of one company's experience in establishing and managing a sales and manufacturing subsidiary in Mexico.

Booklets & Reports

EXPENDITURES FOR PROCESSED FOODS. *Marketing Research Report No. 458, USDA, Agricultural Marketing Service, Marketing Economics Research Div., Washington, D. C. 54p.* provides data for employee food services in manufacturing plants.

FACTORS AFFECTING TEMPERATURE REDUCTION AND WEIGHT-LOSS IN VACUUM-COOLED LETTUCE, *USDA, Marketing Quality Research Div., Agricultural Marketing Service, Washington, D. C. (Marketing Research Report No. 469).* Details this relatively new method of cooling fresh produce.

HANDLING AND MERCHANDISING FROZEN FOODS *by F. Miles Sawyer. Food Distribution Program, Cooperative Extension, Stockbridge Hall, Univ. of Mass., Amherst, Mass.* Emphasizes quality deterioration and handling, including discussion of processing, warehousing, transportation, and distribution.

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READER INQUIRY SERVICE

FREE . . . to you! Cost-cutting, profit-making information.

Facts about equipment, ingredients, packages, supplies and services described or advertised in this issue are easily available to you through this section.

Numbers on back of each tear-out post card correspond to the key numbers on equipment, package, ingredient, sanitation, supply, or service items, and to advertisements.

It's easy. All you do is . . .

Select . . . items that interest you as you read this issue. All items are conveniently named in two lists on the following three pages. First list is alphabetically arranged by name of manufacturer or supplier. Second is alphabetical by product or service category.

Then . . .

Circle . . . number of each item you want on the back of one of the post cards.

Write . . . your name, title, company, and address in space provided on card.

Check . . . **"IMPORTANT MUST INFORMATION"** on card.

Mail . . . No postage necessary if mailed in U.S.

Use of inquiry cards restricted to those with buying authority or responsibility in food manufacturing.

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

FIRST CLASS PERMIT NO. 23708 PHILA. 39, PA.

BUSINESS REPLY MAIL
No Postage Stamp Necessary if Mailed in U. S.

POSTAGE WILL BE PAID BY
FOOD Engineering

The Computer Center
P.O. Box 1970, Camden 1, N. J.

Advertisers' Alphabetical Listing

Circle corresponding numbers at left on Inquiry Card

19 Allegheny Ludlum. Stainless steel.
21 Automatic. Automatic lift truck.
98 Beckman Instruments. pH electrodes, data file 18-12-16.
102 F. L. Burt. Piston filler.
4 Butler Mfg. MRF design.
11 Chester-Jensen. Cooker-cooler.
99 Creamery Package. Cold pack processing.
53 Corn Products. Sugars, starches, & syrups.
18 Distillation Products. Distilled monoglycerides.
103 Dodge & Olcott. Lemon & orange oils.
25 Dragoco. Menthol recryst. puriss.
6 FMC. Continuous pressure vessel.
48 FMC. Auger fillers, bul. P-811.
5 Fostoria. Infrared process.
14 B. F. Goodrich. Vinyl conveyor belts.
84 Great Lakes Carbon. Perlite filteraids.
96 Hercules Powder. Hydrolyzed vegetable protein.
106 A. E. Illes. Flavors.
118 International Flavors & Fragrances. Flavors.
32 Johns-Manville. Diatomite filter aid.
9 Kraft Foods. Stabilizer.
63 Ladish. Positive rotary pumps.
93 La Porte Mat & Mfg. Flexible steel conveyor belts.
105 Link-Belt. Conveyor screws, book 2989.
13 Miles Chemical. Citric acid.
68 Minneapolis-Honeywell. Food processing instrumentation.
22 Neptune Meter. Syrup meter, bul. 566LF.
88 Niagara Blower. Air conditioners, bul. 58 & 122.
75 Nichols Engineering & Research. Spray dryer laboratories.
117 Norda. Flavors.
2 Olin. Cartons.
24 Optics Technology. Process control refractometer.
81 Owens-Illinois. Corrugated boxes.
28 Pfaudler Permutit. Separator, bul. 1002.
107 Phillips Chemical. High density plastics.
85 Pneumatic Scale. Pneumatic cleaning unit.
101 Pulverizing Machinery. Automatic milling operation.
119 Resina Automatic Machinery. Automatic screw capper.
29 Riegel Paper. Pouch-in-liner.
50 Rohm & Haas. Diastatic enzymes, sample.
66 C. G. Sargent's Sons. Dryer.
10 Sheffield Chemical. Protein supplements, sample.
58 Speas. Apple pectin.
78 Sterwin Chemicals. Ingredients.
61 Stokes Corporation. Freeze-drying.
108 Strahman Valves. Valves.
52 Surface Combustion. Frost-free cooling.
31 Taylor Instrument. Control systems.
100 Thayer Scale. Scales.
64 Triangle Package Machinery. Bag maker.
47 Toledo Edison. Plant locations.
34 U. S. Steel. Cyclone conveyor belts.
36 Urschel Laboratories. Cutting machine.
95 R. D. Webb. Coconut flavor.
16 West Carrollton Parchment. Vegetable parchment.

Product or Service Category Listing

Air Conditioning & Refrigeration

88 Air conditioners. Niagara Blower.
219 Displacement blowers. Dresser Industries.
258 Fans, blowers, & heaters. Emerson Electric.

Cleaning & Sanitation

252 Dust collector. Pangborn.
255 Dust masks. Flexo Products.
416 Liquid concentrates. Klenzade Products.
418 Organic chlorine sanitizer. Borden Special Products.
417 Oscillating spray washer. Ross & White.
253 Plant cleaners & sanitizers. Puritan Chemical.
85 Pneumatic cleaning unit. Pneumatic Scale.
413 Portable spray washer. National Equipment & Leasing.

Construction & Fabrication

256 Corrosion resistant grout. Steelcote.
254 Grating & stair treads. Blaw-Knox.
4 MRF design. Butler Manufacturing.
414 Plastic cement compound. Monroe.
202 Prefab panels. Dow Chemical.
19 Stainless steel. Allegheny Ludlum.
251 Urethane coatings. Better Finishes & Coatings.
415 Vessel plastic coating. Pfaudler.

Disintegration Equipment

101 Automatic milling operation. Pulverizing Machinery.
232 Crusher. Sprout Waldron.
36 Cutting machine. Urschel.
228 Humane slaughtering units. Cincinnati Butchers' Supply.

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

Do you wish to receive FOOD Engineering? YES ☐ NO ☐

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Where ads offer more than one item, I've written key number and identity below

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DECEMBER 1961
Expires Feb. 28, 1962

IMPORTANT MUST INFORMATION

Please check in A & B below best description

A—Your Function

☐ 1. Corp. or Admin. Mgmt.
☐ 2. Plant Operat. Mgmt.
☐ 3. Tech. or Eng. Mgmt.
☐ 4. Other

B—Principal Product

☐ 1. Baked Goods
☐ 2. Beverages
☐ 3. Confectionery
☐ 4. Fruits & Vegetables
☐ 5. Grain Products
☐ 6. Meat, Poultry, Fish
☐ 7. Milk & Milk Products
☐ 8. Sugar & Sugar Products
☐ 9. All Other Foods

FE 98

←**CHECK** *Important Must Information*

WRITE—*name, title, company and address*

CIRCLE—*number of items you want*

MAIL

Freezing Equipment

234 Continuous freezing equipment. Chemetron.
52 Frost-free cooling. Surface Combustion.
274 Transport refrigeration. Chemetron.

Heat Transfer Equipment

11 Cooker-cooler. Chester-Jensen.

Ingredients & Additives

58 Apple pectin. Speas.
13 Citric acid. Miles Chemical.
421 Citrus oils. Fritzsche Bros.
50 Diastatic enzymes. Rohm & Haas.
18 Distilled monoglycerides. Distillation Products.
95 Flavor, coconut. R. D. Webb.
106 Flavors. A. E. Illés.
118 Flavors. International Flavors & Fragranees.
117 Flavors. Norda.
419 Fungal enzyme. Miles.
96 Hydrolyzed vegetable protein. Hercules Powder.
78 Ingredients. Sterwin Chemicals.
103 Lemon & orange oils. Dodge & Olcott.
25 Menthol recryst. puriss. Dragoco.
10 Protein supplements. Sheffield Chemical.
9 Stabilizer. Kraft Foods.
53 Sugars, starches, & syrups. Corn Products.
420 Tenderizing formulation. Griffith Laboratories.

Instruments, Measurement & Control

207 Automatic bulk weigher. Richardson Scale.
233 Cascade control. Fischer & Porter.
452 Checkweigher. Mettler Instrument.
473 Checkweigher, in-motion. Exact Weight Scale.
474 Checkweigher, small package. Toledo Scale.
31 Control systems. Taylor Instrument.
68 Food processing instrumentation. Minneapolis-Honeywell.
454 Micro-wave level detector. Hi-Speed Checkweigher.
404 pH analyzer system. Beckman Instruments.
98 pH electrodes. Beckman Instruments.
24 Process control refractometer. Optics Technology.
100 Scales. Thayer Scale.
271 Scales, tank weighing. Howe Scale.
22 Syrup meter. Neptune Meter.
451 Underweight rejector. Illumitronic Systems.
475 Weight classifier. Illumitronic Systems.

Management Services

302 European expansion. First National City Bank.
294 Frozen food bibliography. U.S.D.A.
291 Potato survey. Curtis Publishing.
304 New product service. A. C. Nielsen.
292 R. I. food distribution. U.S.D.A.
301 Social security benefits. Commodity Research.
295 World food budget study. U.S.D.A.

Materials Handling

21 Automatic lift truck. Automatic.
403 Carton unloader. Vibra Screw Feeders.
34 Conveyor belts, cyclone. U. S. Steel.
93 Conveyor belts, flexible steel. La Porte Mat & Mfg.
14 Conveyor belts, vinyl. B. F. Goodrich Industrial Products.
267 Conveyor HP requirements. Hewitt-Robins.
105 Conveyor screws. Link-Belt.
230 Dry ingredients feeder. Creamery Package.
268 Economic truck operations. Lewis Shepard Products.
266 Fork truck. Clark Equipment.
273 Lift trucks. Allis-Chalmers.
203 Pneumatic flour handling equipment. Bishopric.
231 Vibratory screens/conveyors. Comco.

Mixing Equipment

99 Cold pack processing. Creamery Package.
236 Continuous mixers. Falls Industries.
237 Cottage cheese equipment. Kusel Dairy Equipment.
405 Turbine mixers. Barrington Industries.

Moisture Removal

66 Dryer. C. G. Sargent's Sons.
61 Freeze-drying. Stokes.
75 Spray dryer laboratories. Nichols Engineering & Research.

Packaging Equipment

479 Applicator, small wheel. National Starch & Chemical.
48 Auger fillers. FMC.
455 Automatic machine. Amasco.
467 Bag filler. Smico.
64 Bag maker. Triangle Package Machinery.
244 Case packers. G. J. Meyer.
460 Case sealer. ABC Packaging Machine.
461 Case sealer. General Corrugated Machinery.

DECEMBER 1961
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FE 98

Name ..... Title .....

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City ..... Zone ..... State .....

Do you wish to receive FOOD Engineering? YES ☐ NO ☐

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Where ads offer more than one item, I've written key number and identity below

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462 Carton handler. FMC.
480 Carton sealer. United Shoe Machinery.
481 Cartoner. R. A. Jones.
409 Cube-sugar cartoner. R. A. Jones.
459 Double-tube machine. Hayssen.
457 Double-tube unit. FMC.
477 Filling-closing system. Bemis Bros. Bag.
465 Filling unit. Bursak Packaging Machinery.
453 High-speed unit. FMC.
242 Liquid fillers. Ertel Engineering.
470 Overwrapping unit. Package Machinery.
206 Packing machine. American Can.
102 Piston filler. F. L. Burt.
463 Piston filler. Elgin Mfg.
469 Pneumatically-operated machine. Versapak.
476 Pouch-packer-cartoner. Bartelt Engineering.
464 Rotary filler. Karl Kiefer.
119 Screw capper, automatic. Resina.
478 Semi-automatic machine. W. R. Grace.
468 Straight-through sealer. Packaging Industries.
458 Till seal machine. Bemis Bros. Bag.
270 Uncaser. G. J. Meyer.
456 Weigher-wrapper. Triangle Package Machinery.
472 Wrapper-cartoner. Lynch.
471 Wrappers. FMC.

Packaging Materials

317 Aerosol container. American.
311 Carton, split-pak. Stone & Forsyth.
315 Carton, wraparound. Container Corp. of America.
2 Cartons. Olin.
312 Case, soft drink. Container Corp. of America.
318 Cellophane/polyethylene pouch. Dow Chemical.
241 Corrugated container colors. Stone Container.
239 Creative package design. Paramount Packaging.
316 Film, shrink-tight. Goodyear Tire & Rubber.
313 Foil-paper-poly pouch. Riegel Paper.
406 Label gum. H. B. Fuller.
107 Plastics, high density. Phillips Chemical.
240 Polyethylene. Pollock Paper.
29 Pouch-in-liner. Riegel Paper.
243 Pressure sensitive labels. National Tag.
314 Pouches, laminated. Dow Chemical.
16 Vegetable parchment. West Carrollton Parchment.

Pipes, Valves, Tubing

221 Gate valves. Lunkenheimer.
215 Gate valves, steel. Lunkenheimer.
407 Homogenizer, valve control. Manton-Gaulin.
220 Pneumatic spray nozzles. Spraying Systems.
217 Pressure hose. Atlantic Metal Hose.
401 Tubing, fibre-glass. Apex Fibre-Glass.
212 Valve sizing. OPW Jordan.
108 Valves. Strahman Valves.

Plant Services

229 Electronic water sterilizer. Water Processing.
201 Hardwood bin boxes. J. H. Dunning.
218 Inert gas generators. C. M. Kemp.
257 Protective gloves. Wilson Rubber.
259 Safety glasses. American Optical.
214 Tanks & pressure vessels. Nooter.
205 Wash fountains. Bradley Washfountain.

Plant Site

47 Plant locations. Toledo Edison.
303 Plant sites. Small Business Administration.

Power & Steam Generating

402 Torque actuator. Menasco.

Processing Equipment (Heat)

225 Continuous food fryer. Jabez Burns.
6 Continuous pressure vessel. FMC.
5 Infrared process. Fostoria.

Pumps & Air Compressors

222 Canned pumps. Allis-Chalmers.
213 Electrohydraulic pumps. Oilgear.
216 Proportioning pump. Jaeco Pump.
63 Rotary pump, positive. Ladish.
211 Rotary pumps, stainless. Creamery Package.

Separation Equipment (Dry)

269 Electric vibrators. Syntron.
235 Vibratory screen. Comco.

Separation Equipment (Wet)

32 Diatomite filter aid. Johns-Manville.
227 Magnetic filtration. Eriez.
84 Perlite filteraids. Great Lakes Carbon.
28 Separator. Pfaudler Permutit.
226 Water filters. Hagan Chemicals & Controls.

Shipping Containers

81 Corrugated boxes. Owens-Illinois.
466 Unit containers. Ekco-Alcoa.

Washing Machines

408 Produce washer. Veg-A-Peel.

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

FIRST CLASS
PERMIT NO. 23708
PHILA. 39, PA.

BUSINESS REPLY MAIL
No Postage Stamp Necessary if Mailed in U. S.

POSTAGE WILL BE PAID BY
FOOD Engineering

The Computer Center
P.O. Box 1970, Camden 1, N. J.

*When all is said and done... there is just one thought at this time of year—

Merry Christmas

and every good wish for the new year

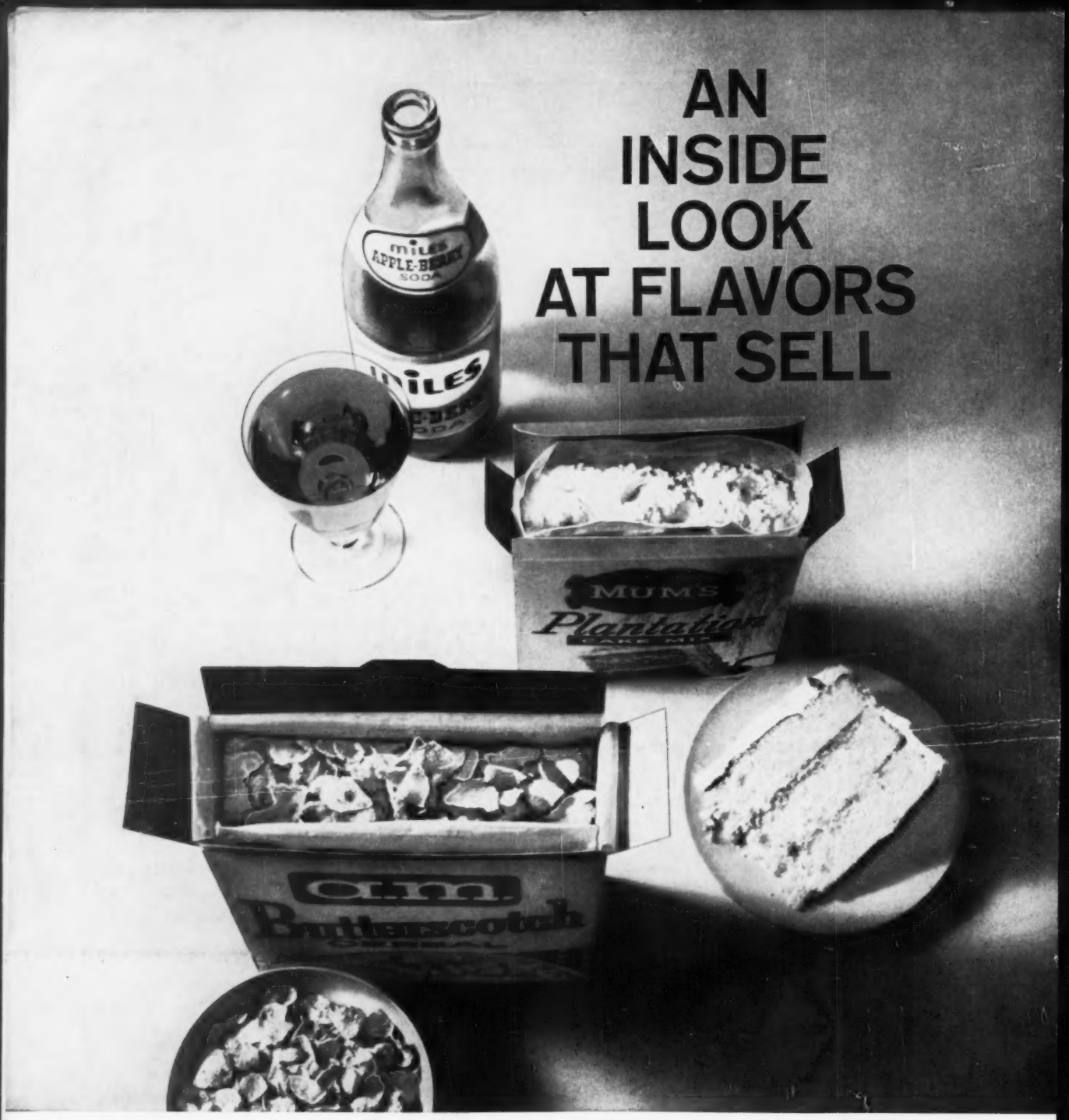
Norda®

NORDA, 601 W. 26 St., New York 1, N. Y.

Chicago · Los Angeles · San Francisco · Toronto · Montreal · London · Paris · Grasse · Mexico City

CIRCLE 117 ON INQUIRY CARD

CIRCLE 118 ON INQUIRY CARD →



Look closely at any successful flavored product. Taste it, compare it. Why is it some flavors have compelling consumer appeal?

IFF flavors sell and resell for two important reasons. They are exclusively designed for your product, your markets—and they are the finest flavors available. IFF flavors have created new product lines, improved established ones and stimulated brand-building sales the world over.

To manufacturers interested in selling abroad, IFF can supply your flavor—uniform in taste—from any of its plants throughout the Free World.

For an inside look at flavors designed to sell your products, contact IFF.

FLAVOR DIVISION

iff

INTERNATIONAL FLAVORS & FRAGRANCES INC.

417 Rosehill Place, Elizabeth 2, N. J.

Leading Creators and Manufacturers in the World of Flavor

ARGENTINA AUSTRIA BELGIUM BRAZIL CANADA ENGLAND FRANCE GERMANY HOLLAND ITALY MEXICO NORWAY SOUTH AFRICA SWEDEN SWITZERLAND U.S.A.